THE HOUSEKEEPER'S HANDBOOK OF CLEANING

SARAH J. MacLEOD

HARPER'S HOME ECONOMICS

EDITED BY

ISABEL ELY LORD

DIRECTOR OF THE SCHOOL OF HOUSEHOLD SCIENCE AND ARTS, PRATT INSTITUTE

HOW TO COOK AND WHY. By ELIZABETH CONDIT, Assistant Supervisor in Household Science, and JESSIE A. LONG, Instructor in Cookery, Pratt Institute.

PLANNING AND FURNISHING THE HOME. By MARY J. QUINN, Instructor in Design, School of Household Science and Arts, Pratt Institute.

THE HOUSEKEEPER'S HANDBOOK OF CLEANING. By SARAH J. MACLEOD, Instructor in Care of House, School of Household Science and Arts, Pratt Institute.

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CLEANING-CLOSET

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BY

SARAH J. MacLEOD

INSTRUCTOR IN CARE OF HOUSE
SCHOOL OF HOUSEHOLD SCIENCE AND ARTS
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ILLUSTRATED

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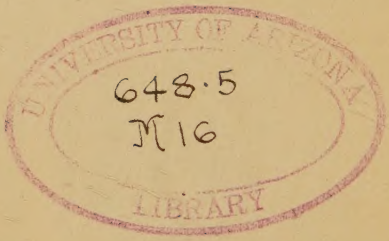

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PREFACE

THE housekeeper has two tasks that together absorb the greater part of her time, her energy, and her income—the provision of food for her household and the keeping clean of the house and its contents, including the wearing-apparel of all the family. An earlier volume of this series, *How to Cook and Why*, offers aid in the first problem, and the present volume offers aid in the second.

Those who follow the Questions and Answers columns for housewives that appear in newspapers and magazines know that a large majority of the questions asked and the answers furnished deal with some aspect of the cleaning question. One person prefers one method, another a second method, another a third method, and so on to many and various methods. But few of those who make recommendation have tried *all* the methods and know which is really best. Many times a method is adopted that produces one good result but another and important bad one, as, for example, the method of covering ice. As is

explained in the chapter on "Refrigerators," the gain in a reduced ice bill is offset by the loss in the preservation of food.

It must be frankly confessed that even in the laboratories where experiments in the applications of science to household problems are made, not all has been learned that we ought to know. But many tests have been made, some things are pretty well proved, and many more have been established as probabilities.

This book contains the results of such testing, in both laboratory and home. It deals with the numerous aspects of cleaning that come within the housekeeper's range. Each housekeeper must do her own testing, for her immediate problems, but this little volume is a sort of laboratory guide for her to save her time and energy as she goes forth in the daily battle against dirt.

ISABEL ELY LORD.

PRATT INSTITUTE, *January, 1915.*

THE HOUSEKEEPER'S HANDBOOK OF CLEANING

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I

IMPORTANCE AND COST OF CLEANLINESS

DICTIONARIES define cleanliness as the state of being free from dirt and filth. To many inexperienced housekeepers cleanliness means freedom from obvious dirt. The dust and dirt which is unconcealed and open to the public gaze is usually open also to the helpful influence of light, air, dryness, and sunshine. Freedom from dust should not be decried, but the dust which usually settles on tables, chairs, and the rest of our furniture is composed chiefly of inorganic and dead matter. Because it is such and cannot support life, it is not necessarily harmful.

When, however, that dust is stirred up and is breathed into the mouth and nose and perhaps

farther into the respiratory organs, it may cause abrasions of the linings of these organs, thus possibly make an opening for the lodgment of some harmful organisms, and thus lower vital resistance. It is well to remove dust as soon as possible, and in a method that prevents its flying, such as by the use of dampened dusters. But it is for concealed dirt and dust that the housekeeper should ever and always lie in wait. Far too many people dust their drawing-rooms and neglect their cellars! The invisible dust usually is concealed in darkness, and too often dampness is also present. These three "d's"—dust, darkness, and dampness—form a terrible triumvirate which may cause really dangerous dirt, because they offer the best condition for bacterial growth, wherever there is warmth enough.

The fact that a few people seem to thrive in dirty houses and neighborhoods is no argument against the need of cleanliness. The fact that the people do survive under these conditions helps to show how strong nature must be. How much better in health these people might be if they could be put into a clean environment we do not know. The very fact that people are content to live in dirty, filthy surroundings shows that they lack some important factor in their make-up. Their lack of standard of cleanliness may be due to ignorance, or, worse still, it may be due to sheer laziness and lack of thought.

Cleanliness is expensive. Mrs. Ellen H. Rich-

ards, the pioneer in this country of the application of science to the problems of the home, in her valuable little book *The Cost of Cleanness*, says that to keep "just above the diphtheria level" takes one-quarter as much as is paid for rent, and that for a really sanitary cleanliness there will be required "a sum equal to nearly or quite one-half as much as is paid for rent, or 12½ per cent. of the whole income."

To obtain cleanliness requires the use of time, labor, strength, energy, cleaning materials, and cleaning utensils. These are all costly. The housekeeper who does her own cleaning knows only too well the hours and the labor which have gone for the possession of cleanliness. If she knows from actual experience the difficulties encountered in acquiring cleanliness, and also the enormous amount of time that can be consumed with so little apparent result, she should have real sympathy for any one whom she employs to do the work and she should also be willing to pay a good price for good work done by an employee.

The fact that a housewife who does her own work adds to the family income should be kept clearly in mind. There is a definite value to every one's service, and although we do not often think of the money value which should be attributed to the service of the housewife, nevertheless her services are of great economic importance. Is there any service of greater economic and social value than that of the woman who keeps her

home in such a condition that her family is kept up to the greatest efficiency? And such service has a high money value, as is quickly found when the housewife drops out of her place and "hired help" has to be substituted for hers. In her reckoning, Mrs. Richards of course assigned a money value to the time spent in cleaning.

Cleanliness is costly and every effort should be made to make it less expensive. Dirt always accompanies life, but there is one thing that we can do, and that is have fewer places for dirt to lodge. In the first place, as to construction: it is appalling to think of the number of useless moldings there are in many houses. Most of these can be taken out at a small cost, and the money actually expended for the removal of these would soon be made up in the time saved in cleaning. Cracks in floors and crevices between floors and baseboards harbor dirt. These can easily be filled in with putty or crack-filler (always a good quality), so that there will be but one surface to clean.

Another common annoyance is the unclean space which one too often finds between a built-in cupboard and the ceiling. Is it possible to think of any other use for this except as a dust-catcher? Unless its existence can be justified it should be boarded up. This can be done by a carpenter, but if that is a too expensive method, an amateur can board with a material such as beaver board. Another useless and often unsightly space is the opening under stairs. This can be converted

into a really useful cupboard for rubbers by boarding it and making a door in the paneling.

Another way in which to cut down the cost of cleanliness is by abolishing some of our furnishing, especially the excess of ornaments. It can never be restful to sit in a room with a profusion of bric-à-brac, each piece of which detracts from the beauty of every other, simply because no one piece has proper background. And the time consumed in dusting these articles is a sad waste. It does not seem possible that any woman can get enough pleasure from a mass of ornaments and bric-à-brac to compensate for the sacrifice entailed in caring for them. Surely no other member of the family does.

In the furniture itself every effort should be made to get that which entails the least work to keep it free from dust, and fortunately the furniture with the best lines usually has few dust-collecting crevices.

Wherever man enters there is dirt and dust, so that we cannot eliminate the problem, but we can eliminate everything that simply affords a place for dust to collect and has no beauty. By this method the cost of cleanliness in many homes can be greatly reduced.

The importance of cleanliness to the health of the family is generally recognized in these days of greater knowledge of the methods of carrying disease, and the right conditions of good living, but its importance to the family happiness is per-

haps not so generally conceded. Yet there are few human beings who do not find greater pleasure in a home that is spotlessly clean (unless it has been made to look unlike a home in the process) than in one that lacks that grace. The novelist knows well that a sense of pleasure is imparted to the reader when he is told of the shining cleanness of a given room or house. That pleasure is keener in those who get the impression direct from the room or the house, and the life of the family is thus enriched by the care of the housewife in keeping the house clean.

II

VENTILATION

CLEANLINESS in air is quite as necessary as any other form of cleanliness; indeed, it is perhaps safe to say that it is more essential. Our sight makes us conscious of soiled floors, walls, or any soiled articles, but we are not conscious of soiled air until we feel the effect of it, and many people do not even recognize these effects. Considering the fact that there is air in all parts of the house, that everything is surrounded by air, and that we cannot escape it as we might anything else that has become soiled, it behooves us to be very careful that the air in our homes is clean.

The question is, what constitutes clean air? If we take a saucepan, wash it thoroughly in hot soapy water and rinse it in boiling water, we believe that we have a receptacle clean enough in which to cook our food. How shall we procure air which we consider clean enough to breathe into our bodies?

Until very recently the great impurity in bad air was considered to be the amount of carbon dioxide. This is a gas formed by the union in the lungs of the oxygen of the air breathed in, with the carbon of the carbonaceous waste products of the blood. Carbon dioxide is normally present in the air, but only in small quantities. To-day, besides the excess of carbon dioxide, the presence of other foreign matter in the air is conceded to be very important. The other impurities are organic matter thrown off from human bodies, similar products of combustion from the fires and lights in the house, possible gases from drainage, and dust, which always has mixed with it germs, and sometimes dangerous germs. The solid impurities in air settle out as dust and can be removed by mechanical means, and therefore they are not a problem of ventilation. The process of removing gaseous matter from the air, however, is such a problem.

The out-of-door air is cleaned by nature by the action of rain and wind. The rain washes the air and the wind prevents it from becoming stagnant. The air inclosed in a house, however, is carefully tucked away from these natural cleansing agents and thus the aim of proper ventilation is to clean the air in a way as nearly similar to nature's as possible.

To consider the primary meaning of ventilation, the word is derived from the Latin *ventus*, meaning *wind*. Thus to fulfil the meaning of the

word we must have wind, or a current of air. We have more or less motion produced by the moving of articles and of persons in the house. These currents are a help, but they are not enough to prevent the air from becoming stagnant. To ventilate truly there must be both an inlet and an outlet for air; there must be what is commonly called a draught of air.

This draught may be obtained by having two openings into a room, such as (1) one window open top and bottom, (2) two windows, (3) window and a door, (4) two doors, (5) a window or door and a transom, (6) a window or door and a fireplace, (7) a window or door and a register. If there are not two openings, as is the case with a casement window, or when but half a window is screened, very often if the single opening is large enough, the out-of-door air will enter at the bottom of the opening and the heated air will be forced out at the top. No matter by what means a room is ventilated, the ventilation simply consists in changing the air. The air does not move of its own accord, but the movement of the air is caused by the difference in temperature between the outside and inside air—that is, as the cold air comes into the room it forces the heated air to the upper part of the room and out of the room because cold air is heavier than heated air.

Ventilation depends largely upon the differences in temperature of the air of various parts of the room. Any one who has ever hung draperies

knows that the air at the top of the room is warmer than that near the floor. Why this difference? It depends on the fact that the air, like any other gas or mixture of gases, as it becomes heated, expands. Therefore a given volume of the heated air is lighter than the same volume of the cooler, and thus the hotter air is found higher up in a room. As cool air enters a room the tendency is to push up the heated air and force it out of the room through an opening nearer the ceiling. If it finds no exit it will pass out eventually by the same opening through which the cold air entered.

Fortunately there are means for air to enter a room other than those especially made for that purpose. It enters through cracks and crevices in and around doors and windows as well as by the doors and windows themselves. A certain amount filters through the walls of the house. It enters and leaves by all openings, whether or no they are meant for the inlet and outlet of air.

The ventilation of a room depends on the fact that heated air is lighter than colder air, therefore rises, and the cool air comes in and takes its place. The ventilation of the entire house depends on exactly the same principle. The heated air in a house rises and the cooler air beneath takes its place, so that by this constant changing the air from the basement or cellar has every chance to permeate the whole house. For this reason the ventilation of the basement is

most important, although very often neglected. If impure air is harbored there, one can feel reasonably sure that the air in the rest of the house is not as pure as it ought to be and can be.

If there must be an inlet for fresh air in the basement, should there not be an outlet for used air in the top of the house? The need of an exit is quite as pressing as that of an entrance. This escape may be a skylight in the hall, which can be adjusted according to the weather, or the exit may be supplied by opening a window in any of the open rooms on the top floor.

Electric fans are valuable for producing good ventilation. They change the air currents so that the heated and cold air become better mixed, thus producing a more even temperature.

Moisture is essential to good air. If the air is dry there is too quick evaporation of moisture from the body, with the result that the skin becomes parched and dry. Moisture should be supplied especially to artificially heated houses. There are different types of air-moisteners on the market. In general they consist of some kind of a receptacle that holds water which is exposed to the air. As the air becomes dry the water is evaporated, and the air assumes at least a portion of its natural humidity. The simplest device in steam or hot-water heated houses is an open can of water hung on the back of the radiator or placed in close contact with it. Where hot air is used, a special device can be procured

for the furnace that supplies water to the air before it reaches the rooms.

Lack of moisture in air is bad, but, on the other hand, the excess humidity which is present in a poorly ventilated room crowded with people is also an impurity because it diminishes the normal evaporation of moisture from the body. Air that is heated has a greater capacity for holding moisture, and, if moisture is not supplied in some way, it will take moisture from the bodies of the inhabitants of the room.

Besides moisture and motion, temperature is a very important factor in ventilation. In this country houses are kept much warmer than in England or on the Continent, and are usually kept too warm. A temperature of 65 degrees is high enough, although it is not definitely injurious to let it run to 70 degrees. It should never go over that.

Experiments are being conducted on the differences in physical and mental vigor due to change in temperature. The results can hardly be called conclusive yet, but so far they all go to show that there is a steady decrease in temperature from the high degree at which plant life develops best through the lower temperature most favorable to the development of animal life, to a lower one where the physical vigor of men is at its finest, to the lowest of all, the temperature at which mental vigor is greatest. This last point runs down to 35 degrees, but of course physical conditions must be considered also.

Americans should work their ordinary house temperature gradually down from the frequent 72 degrees to some point near 60 degrees.

Ventilation is important during the day, but more care is needed to procure good ventilation in the evening, when artificial lights are using up the air and when curtains are closely drawn so that air is not admitted as freely through the crevices around the windows. Ventilation in the evening can be obtained by any of the means used during the day, but the caution is that we must guard against lack of ventilation.

To furnish fresh air to the sleeper at night is fully as necessary as to give pure air to the occupant of the house during the day. Here we must take notice that good air is not necessarily cold. While a cold sleeping-room may be desired and may be the best for many people, no one should get the mistaken idea that a cold room is the only kind in which it is healthful to sleep. The breathing of cold, damp air may be very injurious to persons in certain conditions of health. A warm room, provided there is a good circulation of fresh air, is a well-ventilated room. This means that more heat must be used. Unfortunately ventilation, like all cleanliness, is expensive; it does mean more heat, but the increased efficiency of the inhabitants of a properly ventilated house is a recompense for the increased amount spent for heat.

As much attention should be given to ventila-

tion in summer as in winter. The fact that a house can be kept cool by keeping the windows closed and thus keeping out the heated air should not lead to the great mistake of not airing a house at all during hot weather. It is all very well to close windows during the hottest part of the day, but it is most essential that a house be thoroughly aired morning and evening.

Motion, moisture, and temperature are the important factors in ventilation. It has been shown by experiments that these are more important than the chemical purity of the air—that is, it has been found that where the air was not allowed to become stagnant, the moisture was kept at between 50 and 60 per cent. and the temperature at between 69 and 70 degrees,—an individual could exist normally even though according to chemical analysis the air was impure. This is not an argument for the neglect of purity of air, but a strong one for the consideration of temperature, humidity, and motion.

Ventilation is of primary importance. Living in poorly ventilated rooms may not cause death directly, but it lowers vital resistance, bringing about greater susceptibility to disease and thus increasing the death rate. To be most efficient we must have clean food and clean surroundings, which means not only those things we can see, but also that which we cannot see—air. Clean air is a requisite for clean living.

III

THE KITCHEN

IT is practically impossible to give too much attention to the planning of the details of the kitchen. If the housewife has the good fortune to plan her own home, the kitchen should get a giant's share of attention. If she has to take a house which some one else has planned, then she should make the best of that kitchen by planning the best finish and the best arrangement of furniture and utensils. She has a double aim—to secure the greatest measure of cleanliness with the least possible expenditure of energy, and to secure the greatest possible convenience for work in this laboratory of the home. The two are so intertwined that this chapter must deal with both in order to lay emphasis on the first.

The size of the kitchen is important. It should be large enough so that it can be well ventilated, but it should not be so large as to be a burden in the steps that it means and in the care that it involves. Just recently a woman was showing a new

moderate-sized summer cottage to some friends. Everything seemed well planned and all space seemed admirably utilized until the kitchen was shown. Here the hostess exclaimed with much satisfaction and pride, "And now look at my nice large kitchen!" Large indeed it was, and that seemingly attractive feature to the owner appeared to at least one of the guests the one very bad bit of planning in the whole cottage. Not only was it large, but the arrangement! Against the middle of one wall was the table, of another the range, of another the sink. In a vestibule outside the other wall was the refrigerator. In the center of this kitchen was an immense vacant space with no apparent use except to give a long distance between furnishings which ought to have been as close together as possible. To prepare the simplest meal in this kitchen might well mean walking miles. The cleaning would take twice the time that ought to be needed for the kitchen. And this was planned in 1914! A kitchen about one-half the size of this and furnished with a view to the best relationship of the furniture would have reduced enormously the time spent in the kitchen and the weariness of the individual doing the work.

The idea that a large kitchen is the right thing in a good house comes from the days when it served as family dining-room and family sitting-room. Where that is no longer necessary the kitchen should be considered as laboratory or

KITCHEN-TABLE ARRANGEMENT

KITCHEN-SINK ARRANGEMENT

workshop. What good workman would have his workshop arranged in such a wasteful way as has been described?

At least the housekeeper can usually decide about finish and color of the walls of the kitchen. White tiling is a beautiful finish, and with it walls are easily and thoroughly cleaned. The Ripplin paint that is flowed on, making what is practically an enamel, is also beautiful and sanitary. But both these finishes are very expensive.

There is also a question as to whether white is the right color. At first thought the white kitchen is perhaps the ideal, but direct sunlight in the kitchen is desirable from every point of view, and where one has it the glare caused by the white walls is extremely trying to the eyes.

Oil paint is an excellent finish for kitchen walls. It can be cleaned and is durable. Either a deep cream or a light tan is good. Where paint is not possible because of the state of the plaster, washable paper is a rather good substitute. Oilcloth is a good wall finish also. The cleaning of paint, paper, and oilcloth is treated in Chapter IV.

The woodwork is usually best finished in the color of the walls, and with oil or enamel paint. Enamel paint is more easily cleaned. It is more expensive to put on, but does not wear away as rapidly as does ordinary paint under the constant washing necessary in a kitchen. It is, therefore, as cheap in the end as oil paint, if a good quality of enamel is chosen and applied carefully.

Where there are swinging-doors from the kitchen into dining-room, butler's pantry, or closets, pieces of plate-glass about a foot long and five inches wide, fastened on both sides of the door where the hand will touch it in opening, saves the woodwork from soil and the wear of cleaning.

The wooden floor in the kitchen, to be kept clean by constant scrubbing, is rapidly passing. In its place are being used oilcloth, linoleum, cement, and tile. Tile makes a beautiful floor, though hard and cold to the feet, but its expense is so great that it cannot be used in any ordinary house. Oilcloth is very frequently used, but is an extravagance, as it wears out too soon to justify the expenditure.

Cement is being used to some extent. It is, like tile, hard and cold to the feet, but has the advantage that it can be so laid that it is continuous with the baseboard, curving at the base-line, and offers no cracks anywhere in which dirt can lodge and bacteria flourish. It is expensive, especially if a single floor is to be laid. Where several cement floors (as, for example, laundry, kitchen, bath-room, and basement) are to be laid at once, the cost of each is materially reduced. To clean a cement floor, wash with soapy water and rinse with clear water, wiping dry. Wet spots are slippery and may cause dangerous falls.

The best kitchen floor-covering available for the average housekeeper is linoleum. It is somewhat elastic, and therefore easy to the feet. A

good grade of *inlaid* linoleum is the only kind worth buying. The initial price seems great, but it wears so well and looks so well that it pays.

Linoleum should be laid by an expert. Before being tacked into position it must lie loose on the floor for at least a month so that it can stretch. If this precaution is not taken it invariably buckles and wears out on the ridges thus formed. If a linoleum should buckle, the firm that laid it should be notified at once so that they can remedy their mistake immediately. The edges of the linoleum against the wall may be covered with a quarter molding or they may be cemented. There should be no place at the edges for dirt to collect. Linoleum is sometimes varnished to preserve both color and surface. It is yet to be proved that this lengthens its life. The cleaning of linoleum is described in Chapter V.

The plain hard-wood floor, as has already been said, is rapidly ceasing to exist because it is so hard to clean. An oiled floor has the advantage that dust does not fly from it and that it does not absorb grease, but it grows dark and muddy-looking with age. The cleaning of both is described in Chapter V.

Floors, woodwork, walls, and ceiling for the kitchen must all be washable, and with ease enough to make their frequent washing probable.

The stove and sink are fixtures. Both should have good light, and they should be side by side

where possible. As the plumbing outlet and chimney condition the placing, it is not always possible to place them in this way. But the other furniture is movable, and can be placed in the best possible relation to the two fixtures. In placing the other furniture—the table or tables, shelves, and refrigerator—consideration must be given to the light, both natural and artificial, and also to their relative positions.

A good arrangement is to divide the equipment into two parts, that used in the preparation of the meals and that used in clearing up the meal. The first group, made up of refrigerator, table or cabinet, and stove, should be as close together as possible, and so placed that the "raw material" passes through the processes to the table without any retracing of steps. The second group—sink, storage shelves, and again the refrigerator—must have the same consideration. Shelves for utensils should be placed over or near the sink, so that as dishes are washed there will be but few steps to be taken in putting them away. A shelf above the sink, but far enough up on the wall so that the tallest person using that sink is in no danger of hitting it, is convenient for holding the most commonly used utensils. Saucepans and other utensils with handles may be hung on hooks screwed into the bottom of this shelf.

It is not often possible to get an ideal arrangement in a kitchen not planned by the user, but every effort should be made so that one does not

cross and recross the kitchen in order to perform any task, whether a simple or a complicated process is involved. If the housekeeper will draw a rough plan of her kitchen, mark some little squares of paper with the name of each large piece of equipment, and try different arrangements, she can soon strike the one that means least energy expended for work done. It will be an amusing exercise for the school boy or girl of the family to trace the path mother must walk in making gingerbread or getting breakfast, computing the different distances under different arrangements.

The kitchen should contain at least one strong, firm chair. A high stool is often a welcome addition to the kitchen, but many people find it very tiring to sit on one. Both must be washable and frequently washed.

The choice, planning, and care of the refrigerator are dealt with in Chapter XI.

Both window-shades and curtains must be easily washable and frequently washed.

Stoves and ranges.—In choosing a coal-range, one with a plain exterior should be taken, not only because it is easier to clean, but also because it radiates less heat. A range without ornamentation is easier to procure now than it was two or three years ago because the manufacturer appreciates the demand for it.

The range can be thought of as two boxes (the fire-box and oven) within a third (the outside). A

system of draughts and dampers is a part of every stove. In the front of the stove just beneath the level of the grate is a row of small openings, which can be opened or shut by a slide. The object of this draught is to admit air that will circulate around and through the contents of the fire-box and thus cause them to burn freely. Above this draught, higher up than the level of the fuel, is a similar row of openings, and this is a check. Its purpose is to admit air which will pass over the fire and cool it. In the stove-pipe is a sheet of metal so arranged that it may close or open the pipe entirely or simply in part. The oven damper is used to control the passage of heated air around the oven. Below the fire-box is the ash-pan. In some ranges the ashes can be dumped directly from the ash-pan into a receptacle in the basement. This arrangement does away with much of the objectionable dirt and dust that are always associated with coal-stoves.

Directions for building a coal fire.—

1. Free both the fire-box and ash-pan of ashes.

2. Place crumpled paper loosely in the fire-box. Allow a corner of it to poke through the grate. Twisting this paper occasionally keeps it from burning out too quickly.

3. Put in some fine kindlings or shavings very loosely and on top of this place some coarser wood, crisscross. A very light sprinkling of coal may or may not be placed on this.

4. Adjust the lids, brush off stove, open lower

draught, close the check, close the oven damper, at least partly, and open the chimney damper so that the smoke may pass up the chimney.

5. Apply a light to the end sticking through the grate.

6. When the wood is burning briskly add a small quantity of coal. Add coal in small quantities at frequent intervals until the coal stands within three or four inches of the top of the fire-box.

7. When burning well the lower draught can be closed. The chimney damper may be partly closed and the oven damper may be opened so that the heat may pass around the oven.

8. If the fire becomes too hot the check may be opened. If it dies down it can be shaken and the draughts again opened. The fire should never be raked from the top.

A good time for blackening a stove is just after lighting the fire, for then it is neither too hot nor too cold. Before applying blacking, the stove should be freed of all grease. This is best done by washing with hot soapy water. A good stove-polish should be used, and it should be applied sparingly with a brush. It is then polished with a brush or cloth.

Many housewives now prefer simply to wash the stove and then occasionally to oil it. This does not give a high polish, but keeps the stove clean and looking well.

Gas-stoves.—Gas-stoves vary from the simple

little single-burner stove to the combination gas-range and fireless cooker. In this assortment the housewife should surely be able to find one to suit her purse. Unless the space in the kitchen does not permit it, a table gas-range should be chosen. This means a range in which the ovens, or ovens and broiler, rise above the top, at one side of the burner. There is no reason why the cook should bend to the oven, except that most ranges were made until recently so that she must. Where space does not allow ovens at the side, one should be chosen with oven above the burners rather than the one below. This is not as good as the one at the side, as, when burners are lighted, the heat strikes disagreeably against the arm raised to the oven, but it is immeasurably better than the back-breaking oven below.

The gas-ranges with insulated ovens and the drums that can be dropped over kettles and thus conserve the heat are excellent, but they are still too expensive for many. The initial cost is large, but they do save fuel and also time. Their cost is that of a good gas-range plus the price of a good fireless cooker.

A gas-plate with a portable oven is not to be scorned, for it can bring about excellent results. Every housekeeper who cooks in hot weather should have something besides a wood or coal stove—either gas, kerosene, gasoline, or alcohol—as the heat of either of these added to warm summer air is hard to bear. It is also uneconom-

ical to burn fuel all the time in warm weather. Meals should be so planned that it is burned for as few hours as possible.

There are some cautions about lighting a gas-stove. First, in lighting a burner the gas should be turned on and allowed to run freely through the burner before applying the match. In lighting the gas-oven the doors of both the broiling and baking ovens must be opened before turning on the gas. This allows any gas which might have leaked into the oven, and that which passes into the oven between the openings of the gas-cock and the applying of the match, to escape, so that one is not running the risk of lighting a mixture of gas and air in a confined space. This warning is important because many serious accidents have happened from the explosion caused by applying a lighted match to the mixture of air and gas inclosed in an oven.

Care should be taken that things being cooked do not boil over and thus stop up the holes of the burners. If this does happen, the burner should be taken off and cleaned by boiling in a washing-soda solution. The burners should never be touched with blacking. The rest of the stove can be washed, blackened or oiled like the coal-stove. After each time of using, the pan in the broiling-oven must be taken care of. This may be simply wiping off crumbs, but if meat has been broiled the pan must be washed.

Kerosene-stoves.—There are two types of kero-

sene-stoves—those with a wick, burning with a blue flame, and those without a wick, in which the kerosene is vaporized before burning. The former has proved itself the more satisfactory type. The objection to kerosene-stoves by many people is the odor. If the stove is kept absolutely clean, the wick in good condition, the oil-tank filled, and the flame turned low enough so that it is blue, there is no odor. The tank should never be filled while the stove is lighted.

The care of the kerosene-stove is practically the same as the care of a kerosene-lamp. The charred portion of the wick should be rubbed off frequently and occasionally the burners should be taken out and boiled in suds or a soda solution. The chimneys of the stoves should be washed like lamp chimneys and the outside of the stove should be washed with soap and water whenever it appears oily or soiled.

Alcohol-stoves.—There are many types of alcohol-stoves on the market at the present time. In general, the wickless type of alcohol-stove is considered the better.

The burners of alcohol-stoves should have the same treatment as the burners of gas-stoves. The rest of the stove should be washed with soapy water, rinsed, and dried whenever necessary.

Electric stoves.—The initial cost of electrical cooking appliances is high because they are made from the more expensive metals. Unless electricity can be obtained at five cents or less per

kilowatt-hour electricity is a far more expensive fuel than either coal or gas. In installing any electrical cooking appliance one must be sure that there is the proper voltage.

The greatest care must be taken that food does not boil over, for it is hard to remove from the coils of the stove. With care in cooking, dusting should be all the regular cleaning necessary for an electric stove. Occasionally it should be washed with a cloth wrung out of soapy water, wiped with a cloth wrung out of clear water, and then wiped absolutely dry with a dry cloth.

Fireless cookers.—Fireless cookers are time, labor, and fuel saving. The box of a fireless cooker is packed with a substance which is a poor conductor of heat, thus when a pan containing boiling material is put into it and the coverclamped, the heat is retained and cooks the food. Most fireless cookers now have stone or metal disks to be used for baking. These are heated and put into the compartment with the substance to be cooked. Care must be taken that the fireless cooker is well made, so that it can be cleaned like any other utensil. The equipment is usually aluminum or a compound of aluminum, and should be cleaned according to the directions for that metal in Chapter VI.

Care of lamps.—

1. The wick should be soft, loose-meshed, and should fill but not pack the burner. Before using for the first time it should be well soaked in oil.

The charred portion should be rubbed off daily with a soft cloth or paper.

2. The burner should be kept clean. It should be wiped off daily and occasionally it should be boiled in a strong soda solution.

3. The reservoir should be well filled with oil so that there will be but little space for the accumulation of explosive gases.

4. The chimney must be kept clean. Any method for cleaning glass may be used.

5. In lighting, the wick should not be turned up to its full capacity at first.

Table.—The work-table should have an easily cleaned surface. Perhaps zinc is as cheap and generally satisfactory as any surface. It wears well and is easily cleaned. Tables with tops of especially prepared porcelain or glass are excellent, but these are too expensive for any except the ample purse.

A wooden-top table is good if properly cared for, but needs a good deal of time and energy. The white oilcloth used a good deal to cover tables has the serious disadvantage that dust, crumbs, and even insects harbor under it. It should never be fastened to the table, if used, but frequently removed in order to scrub the table. The cleaning of such tables is described in Chapter IV.

Above the work-table there should be a set of narrow shelves to hold one depth of jars containing commonly used dry materials and liquids. A cook-book holder with a glass cover is also an

excellent addition. Commonly used small utensils, such as egg-beater, apple-corer, corkscrew, and can-opener, can be hung on hooks arranged on the under side of the lowest shelf. This arrangement saves not only steps, but arm motion, as one does not have to open so many drawers. (See illustration.)

Kitchen tables with zinc-lined bin-drawers underneath (for flour and sugar) are frequently used. They are all right if absolutely tight, but any crack lets in dust or insects, or both. Such drawers should be emptied at least once a month and thoroughly scalded.

Shelves, in general, are more convenient if they are of a depth to hold but one set of receptacles. The shelves are best finished in enamel paint. This finish is easily cleaned and there are no hiding-places for dirt as in the case of covered shelves. Wherever oilcloth or paper is used for shelf-covering, dirt can get in under the edges. Moreover, both are porous. The enameled shelves are cleaned like any enamel paint.

Receptacles.—The best receptacles for storing materials are of glass. These should all be carefully labeled. At a glance one can tell just how much of any given material she has on hand. Jars that come especially for the purpose are excellent, but where that is too expensive, fruit-jars can be used, and small candy-jars are very good for spices and the like.

The best labeling is by printing directly on the

glass with black paint, shellacing this after. Paper labels will remain neat for some time, especially if shellaced, but have to be renewed several times a year.

Attractive sets of receptacles in china, usually blue and white, are on the market. These help in carrying out a color scheme, but they are expensive and not as convenient as glass. For storing flour and sugar white-enameled tin receptacles are satisfactory. Paper bags or boxes should never be kept, but the contents of such packages should be emptied immediately into a glass or metal receptacle, as there is always a chance for dust and insects to get into the paper ones. Even paper-covered tin boxes soon get untidy and dirty, and they must be opened to see how much is in the box.

Cabinet.—A kitchen cabinet often takes the place of a table. These are intended as labor-saving devices, but some of them are made with so many small compartments that they are hard to keep clean. In choosing a cabinet one should be careful about the finish and workmanship and also about the spacing of the shelves. Care must be taken that there is sufficient distance between the lower shelves to allow for the storage of large receptacles. A good strong work-table with a well-thought-out arrangement of shelves over it to meet one's particular needs should save more motion than a cabinet which is made to meet general needs. The cabinet can, it is true,

be moved bodily from one place to another, whereas shelves must be always put up in any new house or apartment, but the cabinet costs so much more that this is an argument in favor of it only for those who move very frequently. Moreover, the cabinet that is right for one kitchen may prove wrong for another. Shelves are cheap and can be changed for greater convenience without much expense.

Cabinets should be entirely emptied of contents at least once a month and washed thoroughly.

Sinks.—A white sink is the most attractive and it is always easy to be sure whether it is clean. Porcelain sinks are excellent, but they are expensive. White-enameled iron sinks are a good substitute and cost far less. Sinks of cement composition are good provided they are well glazed. Slate and soapstone sinks not only have the disadvantage of being dark in color, but they also have seams, which are always undesirable.

Every sink should be thoroughly cleaned after using. A fine sand soap is good for all sinks. For porcelain and enameled sinks kerosene and whiting are especially good. The kerosene cuts the grease and the whiting supplies the friction. After the sink is free from dirt it should be thoroughly flushed with hot (boiling if possible) water. This dissolves the grease in the pipes and flushes it out of the entire system. If this precaution is taken after every dish-washing there should be no trouble with pipes clogged with

grease. The sinks should always be left dry, and so should the drain-boards. This dryness is one effective weapon against water-bugs and other pests.

Even with the greatest care there is likely to be a collection of grease in the pipes and trap of the kitchen sink. It is well once a week to flush the system out with a hot sal soda or lye solution. The best way to use this is to make a solution of either in the proportion of one pound to six quarts of boiling water and pour this into the drain. This solution should stand in the drains a short time and then be flushed out with hot water. The lye or soda cuts away the film of grease which may have gathered. If grease is allowed to stand in pipes and traps, there is always danger of decomposition and the odors which result.

Garbage.—Prompt disposal of garbage is a necessity in a well-kept kitchen. The garbage receptacle kept in the house is best of white enamel, for then one can see at a glance whether or no it is clean. Its cleanliness should never be doubtful. A closely covered pail is good. A straight-sided white-enamel one-gallon jar with cover, kept on the drain-board, takes the garbage as it collects, with the least possible trouble to the cook. The receptacle, no matter what type, should be emptied at the time of each dish-washing and should be thoroughly washed, rinsed, and dried like any other dish.

The out-of-door garbage-can should be cleaned whenever it is emptied. An old broom or a toy broom is excellent for this. A strong soda or lye solution should be used for washing, and it should then be thoroughly rinsed with boiling water. Garbage receptacles must be kept sweet and clean. Paper bags to be used as a lining to the garbage-can are made expressly for this purpose, and save washing the can. They are excellent if one can afford them and if paper is allowed with the garbage under the rules of the municipality. Newspaper may be used in the same way to line the can completely.

All garbage-cans must be kept closely covered, or they are a constant menace to health.

Where there is no garbage collection a garbage incinerator is a valuable addition to the kitchen equipment. The safest and best way to dispose of garbage is to burn it as soon as possible. If it is buried it must be well covered with earth.

The daily care of the kitchen should include washing of tables, wiping of the stoves, washing of sinks and fixtures, the brushing of the floor, and dusting. A more thorough care includes the washing of the floor, washing of walls, cleaning of shelves and drawers. In the care of the kitchen, as in the care of the rest of the house, it is better to keep clean than to make clean. If the kitchen is well cared for daily and weekly, a general cleaning, which usually means an upheaval, should not be necessary.

IV

WOODWORK, WALLS, AND CEILINGS

IN the care of all woodwork there is one caution never to be forgotten—to clean off spots just as soon as they appear. If dirt and grease are allowed to stand on woodwork it means that severe measures must be taken to remove the dirt, and usually where extreme methods are used the finish is removed with the dirt.

Unfinished wood.—Stains should be removed from unfinished wood before washing. Grease stains are the most common. The grease should first be wet with cold water to prevent spreading, and then scrubbed with a strong washing-soda or lye solution.

To bleach an unfinished surface which has been darkened, oxalic acid, made in a solution of one teaspoonful to one cup of hot water, may be applied to the entire surface with a brush. This is allowed to dry and then the surface is scrubbed as usual.

For the washing, the surface should be gone

over with a wet cloth, then scrubbed with a brush and soap or a fine sand-soap. In scrubbing, the brush should always go with the grain of the wood, never across the grain or in a circular motion. After being thoroughly scrubbed, the surface should be rinsed off with clear warm water and then wiped as dry as possible with a cloth wrung out of warm water.

As little water as will do the work properly should be used. If a great deal of water is used the wood becomes water-soaked and darkens. Thorough rinsing is also essential, as otherwise the surface becomes gray and muddy-looking. In washing a wood floor care must be taken not to splash water on the base-board. In washing a table, the edge and under the edge must be carefully washed. This under surface becomes greasy simply from the touch of the hands.

Painted wood.—Warm water and soap enough for a light suds should be used. The cloth is wrung out of this solution and the surface washed. Only a small portion should be attempted at one time. After washing it should be rubbed over with a cloth wrung out of clear water and then rubbed dry with a dry cloth. If the surface is not dried thoroughly it will be streaked. Spots that do not yield to this treatment may be rubbed with a fine scourer, such as whiting. *Soap must never be applied directly to paint.*

Enameled wood.—These surfaces should be wiped off with a woolen cloth wrung out of hot

water, and then rubbed dry with a second cloth. Badly soiled spots may be treated with a fine scourer.

Varnished wood.—Varnished surfaces should be carefully dusted and then cleaned with a soft cloth and oil. Boiled linseed-oil is good. They should then be polished with a dry cloth. Silk and chamois are especially good for rubbing finely finished surfaces.

Waxed wood.—Waxed surfaces are easily cleaned by rubbing with a soft cloth. If the surface becomes marred in any way it is usually best to rub the spot with a very little alcohol. This must be used most sparingly. When the spot is removed, wax should be applied thinly and evenly and rubbed in with a soft cloth.

If a wooden surface is dented, a cloth moistened with very hot water should be applied as soon as possible. Hot water should be applied until the dent is raised and then the surface should be refinished.

Walls and ceilings.—All walls and ceilings should be brushed when a room is receiving a thorough cleaning. A lamb's-wool brush or a broom covered with a cotton-flannel bag which draws up with tapes may be used for this purpose.

Oil-painted walls and ceilings are cleaned by washing with warm soapy water. Water must be used sparingly, only a small portion being washed at a time, and that must be wiped off with a cloth wet in clear water, then wiped absolutely dry.

Walls covered with oilcloth or washable paper are cleaned with a damp cloth. If moisture works in under the paper, the paper will peel off.

Kalsomine for walls can be had in very good tints, but this finish has one great disadvantage—it cannot be washed. The only remedy for a soiled wall is a new coat of kalsomine. This, fortunately, is comparatively inexpensive, but it takes time and causes a good deal of trouble in preparing the room for it. There are a number of commercial wall-tinters that are forms of kalsomine.

Burlap and tapestry covered walls are hard to keep clean. Their rough surfaces hold much dirt. However, the paste fills up the spaces somewhat, so that there are not as many crevices as first thought would judge. Fabric-covered walls should be well brushed with a fairly stiff brush and then dusted with a covered brush.

Wall-papers are cleaned, if not too badly soiled, by rubbing the surface lightly with cotton batting. After this first treatment, the surface should be rubbed with greater pressure. Good results are obtainable in this way. If applied occasionally, the paper can be kept looking well. A cheap-grade cotton batting serves the purpose.

Flour mixtures are sometimes advocated for cleaning paper. It is wiser to avoid these, as they are organic, and if they are not entirely removed they may cause decay of some kind.

Grease spots are the most common mishaps to

wall-paper. To remove these the spot can be covered with white blotting-paper and a warm iron placed over it, repeating with fresh part of the blotting-paper until all the grease is absorbed. Another method is to apply warm Fuller's earth or French chalk, leaving on the spot some hours before brushing off.

Paper left after papering a room should always be kept. Often if an accident occurs a new strip of paper can be put on and the defect entirely removed.

V

FLOORS AND FLOOR COVERINGS

FORTUNATELY the day of nailed-down carpets is almost gone. The sooner all carpets are replaced by rugs the better. Carpets which cover the entire floor hold dust and are hard to clean. Rugs take as much dust for the surface they cover, but the surface is not so great, and they are cleaned much more easily.

Even though a floor is of soft wood, the cracks can be filled and three or four coats of good paint applied. If this surface is covered with one large rug, or with several smaller ones placed where there is the most traffic, the finish will last well. Painted soft-wood floors are not as desirable as hard-wood floors, but they are preferable to carpeted floors.

Painted floors.—To keep these in good condition they should be swept with a soft-hair brush and dusted with a dry mop or duster. Occasionally they may be washed with a slightly moistened cloth.

Varnished floors are cleaned by sweeping with a soft-hair brush and dusting with an oiled mop. A prepared oil mop may be used or an ordinary dry mop moistened with a few drops of linseed-oil and allowed to stand several hours. The results are equally good. They become badly marred if walked on with heavy shoes. The wearing quality of a varnished floor is greatly increased by waxing. The method of waxing is the same as for the waxed floor. The waxed varnished surface can be retouched in worn places, provided one is careful to apply more wax to the surface before the varnish is injured. For a good hard-wood floor a wax finish without varnish is preferable.

Waxed floors have one great advantage—if well cared for, the general appearance of the floor improves with age. That is more than can be said of other finishes. Varnished and painted surfaces are not easily patched in worn places to look well, whereas a worn spot on a waxed surface can be treated so that it is not noticeable.

Waxing floors.—For the original waxing an expert should be employed, as the floor must be properly filled before waxing. To rewax, the floor should be swept with a hair brush and thoroughly dusted. The surface should then be covered with a thin coating of wax. Liquid wax, or solid wax melted over hot water, may be used. This must be allowed to harden and should stand at least thirty minutes; longer is better. The floor is

then polished by rubbing with a weighted brush (on sale at any house-furnishing store or department store), always following the grain of the wood. It is then rubbed with a woolen cloth either by hand or by tying the cloth over the brush.

Floor wax is usually made of a mixture of beeswax, paraffin, and turpentine. Beeswax was formerly used alone for floors, but it is harder to apply than the prepared waxes because it is so sticky.

A waxed floor is a satisfaction, for it looks well with comparatively little care. A waxed floor swept with a hair brush and dusted with a mop always has a good finish and a soft luster which can be procured by no other treatment.

Care of carpets. — The housekeeper who has carpets must use the greatest care in cleaning them, in order to minimize their disadvantages.

In sweeping, the broom should be held almost perpendicular to the floor. The stroke should be short and firm, and at the end of the stroke the broom should be lifted from the floor no more than is absolutely necessary. The sweeper should sweep away from herself and always in one general direction, with the warp threads first and then across, to sweep out the ridges. If the room is large, the dust should be taken up at intervals, otherwise it may blow back.

Sometimes to help collect the dust and also to brighten the carpet, fine damp scraps of paper,

damp bran, coarse salt, damp tea-leaves, or special sweeping preparations are sprinkled on the floor. The moisture on these various substances does catch the dust and prevent some of it from flying into the room. Also the moisture brightens the carpet. However, these things must be used cautiously. The dampened substances must be only slightly damp and even then there is the possibility of stains resulting from their use, especially on light-colored carpets. If salt is used it should be coarse and care must be taken that it is all swept out from around tacks. Otherwise the moisture from it is likely to rust the tacks. Most sweeping preparations contain sawdust and some oil. They hold the dust, but there is so much oil in some of them that if they are allowed to stay in the carpet for any length of time they do stain.

After sweeping it is well to dust a carpet with a cloth wrung very dry out of clear water or out of ammonia water.

A carpet-sweeper may be used for taking up loose dirt in the daily care of a carpet, but it should not replace the use of a broom or vacuum cleaner entirely.

Large rugs.—If a rug is too large to be taken up it can be swept in the same way as a carpet, and then it can be rolled up and the floor underneath swept and dusted.

Small rugs.—Wherever possible small rugs should be taken out of doors, where they can be

thoroughly beaten and swept. This procedure is not possible, however, in many places. If small rugs must be cleaned in the house, before sweeping it is well to place dampened newspapers just under the edge of the rugs and allow them to project well out. These papers catch at least some of the dust. Where rugs cannot be taken out of doors, a vacuum cleaner becomes almost a necessity. Rugs and carpets should be steam-cleaned once or twice a year where there is no good vacuum cleaner, and once in two years even when a vacuum cleaner is used.

To beat a rug properly, the rug is placed right side down on the grass or on dry snow. It is beaten with switches, a rattan beater, or a wire carpet-beater. It is then swept, turned, and swept on the right side. If there is no flat place on which to place a rug it can be placed over a line, beaten, and brushed. It is better to avoid shaking rugs. Holding them at one end and shaking often causes loosening of the threads at the border, and then the edge begins to ravel.

Oriental rugs are beaten like other rugs, but must never be shaken. They should never be steam-cleaned, but should be washed in soap and water. This is done cheaply by Oriental dealers in rugs.

Rag rugs are treated like other rugs, but they need rather frequent washings. They can be washed like any other cotton material. They are especially difficult to clean dry, as the folds

made in the rags by weaving catch and hold dirt.

Matting.—For sweeping matting, a slightly dampened broom or a soft brush is good to use. After sweeping, the surface should be dusted with a damp cloth. If water is spilled on matting it should be wiped up as quickly as possible and then dried by covering with a cloth and applying a hot iron or by the sun and air from an open window. Even with the best of care much dust sifts through even very fine matting, and unless there is a vacuum cleaner for cleansing, it is necessary to take the matting up rather frequently. Matting is an expensive covering, because of poor wearing qualities and cost of thorough cleaning, and its use cannot be advised.

Linoleum.—Dust should be removed with a soft brush or a slightly dampened broom. The linoleum should then be washed with soap and water, using either a mop or a cloth. It must be rinsed with clear water and then wiped dry. Only enough water to remove the soil should be used.

Oilcloth.—Oilcloth is cleaned like linoleum, but even with the greatest care the pattern soon wears off. On the whole, oilcloth is a very poor investment.

Cork carpet.—This is laid like linoleum. It comes in attractive colors, and is excellent for offices or institutional rooms. It is rather expensive for house use, and there is a serious ob-

jection to its use in the kitchen. It is porous, and thus absorbs and holds any grease spilled on it. It is sometimes oiled when first laid, to prevent this absorption. It is cleaned like linoleum.

VI

METALS, GLASS, AND CHINA

THE problem of cleaning metals is a bit different from that of cleaning other materials. In addition to the film of grease, which may have inclosed in it dust, we must also remove the metal tarnishes which are the result of the reaction of the metal, moisture, and either the oxygen in the air, or impurities which may be present in the air, or some content of food. Metal utensils in daily use, if washed in hot soapy water and thoroughly dried before putting away, should need very little special care.

Silver.—The metal which perhaps causes the most distress to the housekeeper because of tarnishing is silver. The tarnish on silver is silver sulphide, which is the result of the union of silver with sulphur. Sulphur compounds are often found in the air where either coal or coal gas is burned, and are also found in organic materials, such as food, wool, and rubber. Every one knows the blackness that results from using silver

with eggs or of leaving it in contact with elastic bands. Because silver is tarnished by sulphur we should be careful, in storing it, not to use woolen materials and also to avoid the use of colored or bleached cotton goods, in the manufacture of which sulphur may have been used.

Silver sulphide is insoluble in water, so that ordinary washing has no effect upon it. If, however, the discoloration is rubbed with common salt and then washed in ammonia water the tarnish will disappear. If ammonia is not used in the wash-water the article will tarnish again very quickly. The reason for this is that the silver chloride, a whitish compound soluble in ammonia, which was formed when the salt was placed on the silver, remains on the silver unless dissolved, and is quickly acted upon again by sulphur, so that tarnish results.

There are many ways in which silver may be cleaned. The most common method of cleaning is by friction such as we get by applying powders like whiting, putty powder, rouge, or prepared powders. The powder is usually mixed to a thin paste with water, alcohol, or ammonia, applied to the entire surface of the silver, allowed to become absolutely dry, and then rubbed with a cloth or chamois. If the silver has a raised pattern a brush is most helpful for getting the powder out of the crevices. The disadvantages of this method are the time it takes and the annoyances resulting from the fine dust of powder that flies off when

the rubbing is done. Some people when they are cleaning by this method tie a piece of moist cheese-cloth over nose and mouth to prevent their breathing in the powder, but the only way of avoiding cleaning the surroundings afterward is to do the work outdoors or in some room where there is nothing to be dusted after.

Pastes prepared by reliable silversmiths are also good to use, but in using any prepared paste or powder we must be sure that the frictional agent in it is not coarse. If it is coarse the silver will surely be scratched. Most of the prepared pastes and powders contain whiting as the main constituent. Its use has already been described. The disadvantages of this method are the same as with the powders.

Silver can be cleaned by placing it in a receptacle, covering it with a strong solution of borax, washing-soda, or potash, and bringing to the boiling-point. It is then boiled about thirty minutes and is next allowed to stay in the solution until it has become cold. It is then rinsed and wiped with a soft cloth or chamois. The result is clean silver, but not highly polished silver. The disadvantages of this method are the time it takes and the cost of fuel, where gas, electricity, or kerosene is used.

Another way is to place the silver in a bright aluminum pan and cover it with cold water. It is then brought to the boiling-point and boiled a few minutes. The essential thing here is that the

pan be perfectly clean and not corroded, for the action depends upon the two metals coming in contact. It is an electrolytic action. When the action is finished a deposit will be formed on the aluminum kettle which of course must be removed. Here, again, the silver will be clean but lusterless. The disadvantages of this method are the same as with the last. The time includes that spent in cleaning the aluminum pan.

Another way similar to this which is often used is to place the silver in a pan in which one or more pieces of zinc are placed. The whole is covered with water and boiled as in the last method. Then instead of leaving the deposit on the pan, the deposit is on the zinc. The disadvantages of this method are the same as those of the last two.

The last way, and the one which bids fair to become most popular, is by the use of a special pan for cleaning silver. Such pans are made in sizes suitable for both small and large establishments. Wire bars are soldered to the bottom of the pan, and the silver must rest on the bars or on some silver which rests on the bars. The silver is then covered with water, preferably warm, for every quart of which there is added one tablespoonful of salt and one tablespoonful of baking-soda. Care should be taken that the salt and soda are thoroughly dissolved before the liquid is poured over the silver. In a few minutes the silver is ready to be removed. It is then rinsed and wiped dry. Again the result is clean but

lusterless silver. This is the one disadvantage of this method which takes far less time than any other.

The reason for the lack of luster where friction is not used is very interesting. If we place under a microscope a piece of silver polished with a powder and cloth we find that the surface, instead of appearing as one would expect a metal, appears like a liquid; it seems similar to mercury. The reason for this is that by rubbing with powder the surface of the silver is broken up very finely, so that the light is evenly reflected. Where no powder is used the tarnish is as thoroughly removed, but the surface does not reflect the light in the same way.

Gray or oxidized silver should be cleaned by washing in hot soapy water. Any of the cleansers which remove the tarnish from silver will remove the finish from the oxidized silver. The gray finish is simply a tarnish applied for ornamentation.

The reason for avoiding any material on which sulphur has been used for wrapping silver has been given. In putting silver away, the best method is to pack it in cases such as are used by jewelers. These are made of a strip of cotton flannel, something wider than the piece of silver, with a second strip half the width laid across this and stitched at intervals so that there is a separate pocket for the handle of each piece. The rough side of the cotton flannel should in both cases be

HAND VACUUM CLEANER

CASE OF SILVER

inside, next the silver. A flap at the other side, folding down over, protects the silver so that the strip may be rolled and tied with tapes. These tapes should be sewed on and there should also be sewed to each case a tag that will hang out at the end and on which the description of the contents is given. These cases are very easy to make and very inexpensive. Dark red and green cotton flannels have both been found good for this purpose.

Silver stored in this way can be kept very compactly, and is easy to get at. Those who prefer to keep silver in the boxes in which it usually comes should letter the boxes in ink so that it is not necessary to open them to find out what the contents are. If they are kept in a drawer, this lettering should be on the top of the box.

Silver that is used frequently is often kept in knife-boxes, but this means a great deal of wear from the consequent rubbing together. For the ordinary house the best method is a case similar to those in which the silver is put away, but large enough to hold it all, and shaped so as to be tacked on the inside of a closet or cupboard door. Such a case displays the silver so that there is no time lost in finding any piece, and protects each piece from contact with the others. It is inexpensive and easy to make. It should be bound with braid, and it is well to have the back piece double, as the weight of the silver means a heavy strain.

It is no longer considered good taste to make a display of large pieces of silver, and all except

those in frequent use should be put away. Cotton flannel bags protect them best.

Copper, brass, bronze.—The carbon dioxide in the air is an important factor in the tarnishing of copper. The tarnish is copper carbonate. This compound is soluble in weak acids such as are found in fruits, and therefore the housekeeper must beware of the tarnished copper kettle in cooking. A bright copper kettle is perfectly safe to use, since copper itself is not affected by weak acids.

Acids such as oxalic, cream of tartar, acetic acid (found in vinegar), citric acid (found in lemons), and buttermilk clean copper very readily, but, unless all trace of the acid is removed, the copper tarnishes again very quickly. After cleaning with an acid it is well to go over the surface with whiting to take up the excess acid. If oxalic acid is used for cleaning a copper cooking utensil, care must be taken to wash thoroughly, as oxalic acid is a poison.

Perhaps there is no better way of cleaning copper than by the use of rottenstone and oil. The rottenstone moistened with an oil, such as sweet-oil, is applied vigorously to the copper and polished with a flannel cloth or chamois. After the cleaning mixture has all been rubbed off it is well to go over the surface with dry whiting, rottenstone, or tripoli. Polishing with rottenstone and oil without an acid gives a much richer luster than when an acid is used.

Ammonia may also be used for cleaning copper, but care must be taken that all traces of it are removed. If it is left on the metal it will react with the copper and a poisonous compound may be formed.

Different commercial preparations for cleaning copper are on the market. In the main these are composed of rottenstone and oil plus a solvent such as naphtha, turpentine, or an acid which hastens the action. The rottenstone and oil is cheaper than any of these, and quite as effective.

As brass and bronze are alloys of copper, the tarnish on both is the same as on copper, and therefore the treatment is the same.

Nickel.—Nickel does not tarnish readily and can be kept in good condition by washing in hot soapy water. If, however, it should become discolored it can be cleaned by rubbing with a paste of whiting or a fine scourer.

Aluminum.—Aluminum also does not discolor quickly, but there is one great care to be taken in cleaning it. Alkalies must be avoided. Soaps and scourers containing free alkali and alkalies, such as washing-soda, ammonia, and borax, must not be used. If it becomes darkened, whiting and a weak acid such as sulphuric, hydrochloric, or vinegar will brighten it. There are special cleaning pastes for aluminum, without alkalies.

Tin.—Tin darkens very slowly also. The best ways of cleaning are by boiling in a solution of washing-soda or by scouring with whiting or a

fine scourer. Scouring tin to make it shine like new is a waste of time and of material, as the tarnish in tin acts as a protection and makes it wear longer.

Steel, iron.—There is one difficulty in caring for steel and iron which is not encountered in other metals. They tarnish most readily in the presence of moisture, and this tarnish, commonly called rust, does not cling closely to the metal as do other tarnishes. The rust scales off and new surfaces are always being exposed to moisture and the air, and more rust, which is iron oxide, is formed. If cutlery and iron utensils are scoured and wiped dry there is little danger of rusting. For the cleaning, a scourer such as Bath brick or fine emery is very good to use. The Bath brick is applied with a moistened cork or cloth and then the utensil is washed and dried. Obstinate rust spots can be covered with kerosene, allowed to stand some time, and then scoured off. If the rust resists this treatment it may be touched quickly with hydrochloric acid, followed by ammonia to neutralize this. Iron and steel when not in use may be protected from the action of the air and moisture by a thin coating of oil, such as vaseline, melted paraffin wax, cotton-seed oil, or tallow.

Zinc.—The tarnish on zinc is zinc oxide, the result of the action of the metal, moisture, and the air. This tarnish is a light-colored compound similar in color to zinc, so that it is not noticeable

except that the zinc loses its metallic luster. For cleaning zinc kerosene is excellent to use. The kerosene dissolves the film of grease so that the inclosed dirt is liberated. Bath brick is also used for cleaning zinc. This is of special value where the zinc comes in contact with food, as kerosene, if used, might contaminate the food. The Bath brick is a little slower method, since there is no agent for cutting the grease. Vinegar and lemon-juice, because of the acids they contain, are also used for brightening zinc. After using either one, the acid must be carefully removed or the tarnish will form again quickly, as the oxidation is hastened by the presence of the acid.

Glass.—The best method of washing glass is a much-argued point. The quickest way is to wash in hot water to which soap, ammonia, or washing-soda has been added, rinse in hot water, drain, and then polish with a soft linen towel. Washing of glass in cold water is all very well for glass with no oily substance on it, but it must be allowed to drain thoroughly and then it must be rubbed most vigorously to obtain a good polish.

In caring for cut glass a soft brush is quite necessary in order to reach the deep cuts. In the pans in which cut glass is washed and rinsed, and on the tray in which it is drained, soft cloths should be placed. These prevent the pans from scratching the glass and also the glass from scratching the pans. It is most essential that all

cloths used on cut glass be free from grit. Just one grain of sand may make a scratch in a cut-glass bowl so that the next time it is submitted to a change of temperature it will break at that point.

For washing, the water must be only lukewarm and it may be softened by the addition of soap, ammonia, or washing-soda. The drying of cut glass is very important. Even with the most careful rubbing with soft towels, moisture is left in the deep cuts. This moisture is sometimes overcome by rubbing the glass in sawdust, which absorbs the excess moisture. We must take care, however, that the sawdust comes from a non-resinous wood, otherwise there will be a resinous deposit on the glass that is not easy to remove. It is better not to place cut-glass dishes on top of each other, but if it is necessary to pile them felt or cotton wadding should be placed between every two pieces.

Cut glass should be protected from the dust by keeping in cupboards. When the housekeeper adds to the first cost of cut glass the time necessary to care for it she finds that she has acquired an expensive article.

Windows.—Good results in cleaning windows depend not so much upon the materials used as upon the way the cleaners are applied. There are two general ways of cleaning windows, one by the use of dry cleaners, the other by the use of liquid cleaners. The dry cleaners are fine

scourers, no coarser than whiting. These are applied evenly to the glass with water, alcohol, or ammonia, allowed to dry, and then polished with a soft cloth, chamois, newspaper, or tissue-paper. Dry cleaners are easily applied and the results are good, but there is always a powder left from them which flies around and settles on other things. For this reason they are not especially good for inside use.

The liquid materials used are (1) clear water, (2) water and washing-soda, (3) water and ammonia, (4) water and kerosene, (5) water and alcohol, (6) alcohol alone, (7) kerosene alone. In applying any of these the caution is to avoid getting too much liquid on the glass. Just as surely as there is enough liquid to run, just so sure are we of having streaked windows. After all soil has been removed, the window may be wiped with a soft cloth, chamois, or paper. A rubber brush can also be used. Soapy water is not good to use in washing windows, as it is apt to leave a cloudy appearance.

For washing in cold weather, kerosene or alcohol is good to use, as neither freezes, but care must be taken that neither touches the framework, as both soften paint and varnish. Paint and varnish spatters are dissolved by alcohol or turpentine, or they may be removed by rubbing with a rough surface, such as a coin, or with a dull knife.

Gas and electric-light globes may be cleaned with either liquid or dry cleaners, but for electric-

light bulbs it is better to use a dry cleaner, since the liquid might short-circuit the lamps and cause trouble when the current is next turned on.

The sediment in water-bottles or cruets can be easily removed by rinsing thoroughly with a small quantity of hydrochloric acid, followed by clear water or ammonia water. Another way to remove deposit is to partly fill the bottle with soapy water and place in it some shot, or dry rice, and shake it around until the sediment is dislodged. After washing bottles and cruets, invert to drain thoroughly, and, when dry, cork to prevent dust from settling in them.

Dish-washing.—The task of dish-washing cannot be escaped, but it can be accomplished more quickly than it often is. Far too many housekeepers have in mind just the end—clean dishes! If they would stop to consider the means to the end, they would find that if more system were used the task could be dispatched more quickly.

In the first place the sink should be considered. Is the sink a comfortable height? Are there drainboards on both sides? If not, how is it possible to arrange some device so that there is space for the piled dishes at one side and the clean dishes at the other?

If the sink is too low, it is an easy matter to place the dish-pan on an inverted pan or a rack so as to bring it to the best height. If the sink is too high, which is very seldom the case, it is an easy matter to procure a stool or low platform of

the right height to bring one into the best position. To be able to stand or sit erect while working means too much to be lightly passed over.

The dish-pans may be either round or oval. Often, in small sinks, especially, the oval dish-pan utilizes space better than a round one. Dish-pans of heavy block tin or enameled ware are good. Sometimes small fiber tubs are used. These are more elastic, so that there is less danger of chipping, but are harder to keep clean.

There is a new dish-pan on the market with a device that ought to be a protection to the drain of the sink. The pan is of heavy tin, rectangular in shape, and stands on four removable rubber legs about one inch and a half high. These protect the sink from the scratching and marring that comes from contact with metal. In the center of the bottom of this pan is a rubber stopper, and when this is removed the dish-water flows out through a strainer, thus preventing any particles from entering the pipes. This strainer slides in and out under the pan, like a drawer, and can be easily removed for cleaning. Instead of the rubber legs to protect the sink, a small-priced rubber mat can be used under any dish-pan.

Dish-drainers are either circular or rectangular. Either type should be of heavy wire and well finished so that there will be few rough places. Opinion is pretty well divided as to which is the better form. The drainer should be scalded and dried after using.

To use or not to use a dish-mop is a much-debated question. A dish-mop can be kept in just as good condition as a dish-cloth, and, moreover, there is no temptation to use a dish-mop for any purpose other than dish-washing. A dish-cloth, of course, should be used only for dish-washing, but far too often it is used for other purposes. If a dish-mop is washed out in a hot soda solution, rinsed in boiling water, and hung to dry after each dish-washing, there is no reason at all why it should not be sweet and clean. The dish-mop does save the hands, if used intelligently. Just as good results are obtainable as with the use of a dish-cloth, and it can be kept in good sanitary condition. Honeycomb and crash dish-cloths are good. The edges of any cloth used for dish-washing should be finished, and the cloth must be treated with respect. After each dish-washing it should be thoroughly washed and hung to dry in a dry, light place—in the sun if possible.

In soaping dish-water a soap-shaker is very satisfactory, not only because good suds are obtainable, but also because one can utilize small pieces of soap by placing in the shaker. Another way is to make a soap solution and keep it on hand for adding to dish-water. Small pieces of soap can also be used in making this. If a cake of soap has to be used to make suds, then it should be rubbed on the dish-cloth, and as soon as a suds is obtained it should be taken out of the water. Sal soda solution can also be added

to wash-water. It is of special value where greasy dishes are to be washed, because it is an alkali and unites with the grease to form an emulsion which is easily washed from the dish.

Linen dish-towels are the only kind worth having, as they absorb the moisture readily and have no lint. The checked toweling (usually either blue or red and white) is the best for glassware, as it is soft and gives a good polish. Crash towels are good in general. One yard is a good length for a dish-towel.

Directions for dish-washing.—

1. Scrape off all particles of food adhering to dishes and utensils with either a spatula or a rubber plate-scraper, and rinse. Soak in soda solution all that cannot be scraped clean *except aluminum*. Aluminum is treated according to special directions on page 53. *Never* use soda on it. Saucepans and cake-pans should be put to soak as soon as used.

2. Sort dishes, place to the right of dish-pan in the following order, the first being next to the pan: glass, silver, china, earthenware and granite-ware, cutlery, tinware, ironware.

3. Prepare two dish-pans half-full of water as hot as the hand can bear. Make a strong soap solution in the right-hand pan.

4. Wash dishes in right-hand pan, and rinse in left-hand pan, in order as above, placing dried dishes to left of rinsing-pan. Change water whenever it becomes perceptibly dirty.

5. (*a*) Never put bone or pearl handles in water.
   (*b*) Never allow wooden handles to lie in water.
   (*c*) Never allow the iron wheels of the egg-beater to get into dish-water.
   (*d*) Scour cutlery with Bath brick after each dish-washing.
   (*e*) Never rub any sand-soap directly on a dish or utensil, but rub on the dish-cloth.

6. Wipe the dishes on clean, dry towels, keeping like dishes together.

7. Wash the dish-towels and dish-cloth, wash and dry the dish-pans, clean the sink with a sink-cloth, and wipe dry all around the sink.

A new device for dish-washing is a fiber mop fed directly through tubes from the hot and cold water faucets. This means no dish-pan, but a constant flow of clean water, the temperature regulated at will. No one likes the idea of washing in water already used, and all housekeepers would welcome a method by which clean water is used for every dish. The question is as to the amount of water needed. The makers of the mop claim that this method uses no more than the ordinary method with reasonably frequent changes of water. This claim must be tested for the housekeeper and, if found not wholly justified, the housekeeper must then decide whether she can afford the extra cost in water. Where this method is used the dishes must be held over

a fine sieve, so that no solid matter gets down the sink pipes.

For home use there are but few satisfactory mechanical dish-washers on the market. There is one, however, in which the dishes are packed into a strainer-like receptacle and then placed in another pan of water. The receptacle containing the dishes revolves and the water is also thrown up in a spray and then down over the dishes. After washing they can be rinsed in the same machine, using clean hot water. The difficulties with most dish-washing machines are that the dishes are not thoroughly washed and the action is so harsh that the dishes are chipped.

Silver and glass must always be dried. China, however, can be taken from the wash-water, placed in a drainer, rinsed with quantities of scalding water, and the dishes simply allowed to stand until dry. This saves time, not only because each dish does not have to be rubbed dry, but also it means that there are fewer dish-towels for which to care. Plenty of scalding water is, however, absolutely essential in order to have this method successful. Where drying is necessary, one cannot be too careful about the condition of the dish-towels. They must be clean and sweet. To keep them in good condition they must be washed, rinsed, wrung, shaken, and hung to dry after each dish-washing.

There are a few important things to remember in regard to the care of fine china. In washing

china with much gilt upon it the water should be only warm, and very little soap should be used. The use of hot water results in a sudden change of temperature which brings about quick expansion or contraction and is very apt to cause the china to crack. After it is dried it should not be piled until it has cooled and then it is often well to place paper between every two pieces.

Dish-washing is one of the household processes often looked on as drudgery that can be made a pleasant task with proper care.

VII

ORNAMENTS, BOOKS, AND JEWELRY

THE first suggestion about ornaments is that there should be careful thought about the number one has. The care of a large number of ornaments and bric-à-brac in general consumes a disproportionate amount of time. If the housewife must retain a lot of bric-à-brac either because she likes it or because of sentiment, then she must make up her mind to spend much time caring for it. A multitude of bric-à-brac is not beautiful, but a multitude of grimy bric-à-brac is an abomination.

Ornaments of metal, glass, and china are to be cleaned according to the material, as described in Chapter VI. The fixed metal ornaments in a room—window-catches, door-plates, gas or electric fixtures, and the like—are often neglected because they are so difficult to clean. This is where the selection is of first importance. Often some fixture of this kind that is difficult to clean can be changed for a better one with very little

expense. The housewife should never accept the "house hardware" as permanent if by changing it she can better both the beauty of her home and the ease with which the hardware can be kept clean.

China and glass ornaments are frequently left without washing for long periods. Since they do not "look dirty" they are given no cleaning except dusting. This is a mistake for the house that is to be a shining example of cleanness. The washing of every china and glass piece in an ordinary room will make a distinct difference in its appearance.

Baskets.—Reed and willow baskets are best cleaned by rubbing with a stiff brush. If the basket is not waxed, it can be scrubbed with soapy water, rinsed, and dried. Raffia baskets are also cleaned by vigorous brushing, but the brush should not be too stiff.

Books.—In general, books on shelves are better not covered with glass, as the circulation of air is good for them, but naturally they do collect more dust in this way.

The thorough dusting of a book entails the clapping of the book in different places, snapping the pages and then wiping with a duster. Sometimes the dust is blown into a duster if it is known to be gritty. This thorough cleaning is best done out of a window—unless this interferes with neighbors. If done in a room it should be over the center of a large sheet of cloth or paper, laid in a

clear space, and the dust should be allowed to settle before gathering up the sheet. This method is never really satisfactory, as some of the dust settles on the books still on the shelves. As the thorough cleaning is a good deal of work, the best method where there is a considerable collection is to have part of the books so treated on every cleaning day, so that in the course of a month or six weeks all have been "clapped." If this process is carried on continuously, the books never get into very bad condition as to dust.

When books are dusted on the shelves, they should be wiped with a cloth away from the binding, then the backs, and then the shelf. The special appliance for books of the vacuum cleaner works well except where the tops of the books are of varying heights.

Leather-bound books are occasionally dusted with a slightly oiled cloth to restore some of the oil which has dried out. This is especially necessary with books that are not handled frequently. If books are handled much, the oil from the hands keeps them in fairly good condition. Storing leather-bound books high up in a room is especially deleterious, as the air is hotter and drier and does not circulate so freely, and thus the books are dried out more rapidly.

The cleaning and repairing of leather-bound books are difficult for the amateur.

Casts.—Plaster casts are cleaned by covering with a paste of French chalk and water, allowing

it to dry, and wiping it off with a cloth. Sometimes, however, they are covered with dry chalk and allowed to stand twenty-four hours or more. The powder is then carefully brushed off. In cleaning plaster casts water should be avoided as much as possible, as it is apt to mar the finish. Casts with the ivory-glazed finish can be washed in lukewarm soapy water, but the process should be carried on as quickly and as lightly as possible.

Ivory.—Ivory is best cleaned by rubbing with a cloth (or for carvings with a soft brush) dampened with alcohol. When yellowed, it may be bleached by wetting with water or alcohol and placing in the direct sunlight, under glass. The process must be repeated until the desired degree of whiteness is obtained.

Jewelry.—For ordinary jewelry, washing in neutral soap solution with a very soft brush is good treatment. It is then dipped in alcohol and rubbed with either very soft tissue-paper or chamois. Jeweler's sawdust may be used for drying the jewelry. The method of use is to put the piece of jewelry in a box of the sawdust and shake lightly until the sawdust has absorbed all the moisture.

Jewelry with stones must be treated carefully, always guarding against the danger of loosening the stone from the setting. Pearls are best cleaned by an expert; it is better for an amateur not to attempt cleaning them. They should always be kept away from hot water.

There are special jewelry-cleaning boxes on the market. These consist of a small cake of especially prepared soap and two soft brushes. One brush is used to apply the soap and the other to polish the cleaned jewelry.

In the case of jewelry, as elsewhere, prevention is worth more than cure. Rings should never be left on the hands when the latter are washed. Soap gets into every little corner and holds the dust that creeps in later. It is well to clean all one's jewelry at one time, occasionally, but the need should not be frequent.

Marble.—Marble ornaments are easily cleaned by washing in soapy water, rinsing, and drying. Where they are stained, it is usually better to consult an expert. Some stains are irremovable, while others yield to treatment, but the amateur has not the judgment to attempt this.

Carving.—In caring for any ornament with carving or raised-work a brush is almost indispensable. Many articles can be washed in suds of mild soaps and the crevices cleaned with a brush with excellent results.

Pictures.—The glass covering framed pictures can be cleaned in any of the ways that glass in general is cleaned, but a minimum amount of water should be used in the process. The frames are best dusted with a slightly dampened duster, and if they are carved it is well to use a small brush—a paint-brush is excellent to reach the crevices. On the backs a coarse brush can be

used. Dark wood frames can be dusted with an oiled duster, but on gilt and bronze frames it is better to avoid entirely the use of oiled dusters. Pictures not covered by glass should be carefully dusted with a perfectly clean dry duster. In every cleaning of a room the pictures should be dusted both front and back.

Pillows.—Pillow-covers should be made so that they can be easily removed from the pillows when soiled. They can then be either washed or dry-cleaned according to the fabric. If pillows or any other fabrics are carefully brushed, dusted, and protected from dust during the cleaning of a room, they should not need frequent washing or dry cleaning.

VIII

HOW TO SWEEP, CLEAN, AND DUST A ROOM

BEFORE dealing with the special problem of this chapter, a few moments may be given to the consideration of one of the most important of the recent additions to cleaning-equipment.

Vacuum cleaners.—All vacuum cleaners clean by suction. They are run by electricity, water power, or hand power. With the different possible attachments rugs, floors, walls, mattresses, pictures, books, and everything else in the house may be cleaned without any scattering of dust. In the usual method of cleaning a room, dust is first scattered more or less, even when the greatest care is taken, and then it is taken up, whereas with the vacuum cleaner the dirt is taken up and deposited directly into a bag or box, either of which is a part of every vacuum cleaner.

Vacuum cleaners run by either electric or water power are very efficient, as the force is much greater than where the power must be applied by hand, but excellent results are possible with hand-power machines.

Practically all vacuum cleaners have a set of attachments for the cleaning of different things. Many people object to the use of vacuum cleaners on fine materials, as they consider that they are hard on the materials, because as they take up the dirt they also take the nap off the material and thus make it wear out more quickly.

In cities of any size there is usually now a company that undertakes the vacuum cleaning of a house, bringing all the apparatus. This is often a valuable help, but it must never be forgotten that this is only dry cleaning in the literal sense of that word, and no liquid touches the articles to be cleaned. It is possible to remove all loose dust by this method, but not that which has become closely attached to surface or material.

The principle on which the vacuum cleaner works is the same as that on which the vacuum washing-machine works—that is, the pressure inside is less than the outside pressure, and therefore the dirt is forced up into the cleaner.

Preparation of room for sweeping:

1. Open windows top and bottom.
2. Dust and remove all ornaments and small pictures.
3. Take down draperies or at least pin them up.
4. Dust heavy furniture and cover with old sheets or with furniture-covers.
5. Dust pictures and mirrors and cover with cloth.

ROOM READY FOR SWEEPING

ROOM AFTER SWEEPING

6. Be sure that all drawers and doors to cupboards and cabinets and all doors leading from the room are closed.

7. Brush radiators and dust. Lift out registers, place on newspaper and clean thoroughly. Brush the hot-air pipe and clean the screen. Cover the opening with a newspaper and place register upside down over it.

8. Remove all brass or steel from fireplace. Clean the grate and fireplace and brush the hearth.

9. Clean the floor and floor covering according to the finish.

10. Brush ceilings, walls, and base-boards, and take up any dirt that has fallen to the floor.

11. While dust is settling remove spots from paint and woodwork and wash the windows if necessary.

12. Remove covers from pictures and furniture and shake out of doors if possible.

13. *Dusting.*—Begin at the top of the room and work toward the floor.

(*a*) *Upholstered furniture.*—Dust with a brush and a soft duster—a silk duster is excellent.

(*b*) *Carved furniture.*—Dust with a soft brush and duster.

(*c*) *Leather furniture.*—Dust carefully, and occasionally rub with a cloth slightly dampened with oil or with a good leather polish.

(*d*) *Window shades.*—

1. Shades with the roller toward the room.—Pull the shade all the way down. Dust a small portion at the top, then roll up that portion, dusting the other side of the shade as it goes over the roller. Continue this until the shade is dusted entirely.
2. Shades with roller next the window.—Pull the shades down entirely. Dust a small portion at the bottom and place the hand underneath and dust the same amount. Roll the cleaned part up, being careful not to pinch it; then do another section and continue this until the entire shade is cleaned.

It is much less cumbersome to dust a shade without removing from the window.

14. Return draperies, ornaments, fireplace fixtures, replace the register, and place the room in order.

Daily care of a room.—The daily care of a room should include removing any dirt from the floor coverings, the dusting of floors, furniture, and ornaments, and the emptying of scrap-baskets.

Bath-room.—The bath-room should be cleaned like any other room, but, in addition, the wash-

bowl, toilet, tub, and any other fixtures should be cleaned daily. The wash-bowl and tub are cleaned according to the material in the same way as any other plumbing fixtures. The stopper and chain should receive attention as well as the overflow pipe. Unless the overflow pipe is flushed with clean hot water there is great danger of dirt collecting there, as generally the only water which the overflow receives is soiled water, and usually not enough of that to flush the pipe properly.

The toilet should also be washed. The best way to do this is to flush it thoroughly and then wash with hot soda or soapy water and a long-handled brush. Even better than the long-handled brush are the large nickel-plated tongs and the prepared soap paper that come especially for cleaning toilets. When the fixture is cleaned the paper can simply be dropped into the fixture and flushed out of the system. The long-handled brush or tongs should be scalded after using. The brush should then be dried in the open air if possible.

Care of bedrooms.—In addition to the cleaning already described the bed in the bedroom must have special care. The springs should be well dusted. The mattress should be beaten occasionally, and should be turned daily. It is well to turn one day from end to end and next day from side to side, so that it will wear evenly. The bedding should be aired at least one hour each day and each covering of the bed should have a complete air bath.

Making the bed:

1. *Mattress-cover.*—This should be placed on smoothly and tightly drawn.

2. *Under sheet.*—This should be right side up, the middle of the sheet in the middle of the bed, and the wide hem should be at the top. There should also be enough to tuck in at both the head and the foot of the bed. This sheet should be tucked in firmly on all sides.

3. *Upper sheet.*—This should be put on right side down with hems the same as under sheet. The wide hem should come just to the frame of the bed. It should be tucked in firmly at the foot.

4. *Blankets.*—The open edges of double blankets should be at the head of the bed and, in general, the ends of the blanket should come nine or ten inches from the head of the bed. It is much wiser to cut double blankets apart, binding the edges, as in this way one-half can be put away as weather grows warmer, whereas with the double blanket the unused half is almost sure to drag on the floor. It is also much easier to wash the blanket in two pieces. The blanket should be tucked in generously and firmly at the foot. The upper sheet is folded over the blankets and then both are tucked in firmly at the sides.

5. The arrangement of the spread and pillows is a matter of taste.

IX

LINEN-CLOSET

A SPECIAL place for the storage of house-linen is a necessity. A special linen-closet is the best arrangement, but when that is not possible something else should be contrived. A well-constructed box or a trunk will serve the purpose, although much less convenient than a closet. A tall chest of drawers is better than this and next best to the closet.

The second-floor hall is the best position for a linen-closet, and if possible it should be in a light place. The shelves are best painted white, and sliding shelves are very convenient. They are not expensive if constructed by a carpenter under direction. Also shelves and drawers should be carefully labeled so that articles can be piled without any difficulty. Clean linen should always be placed at the bottom of piles, so that the linen is used in rotation and thus wears evenly.

The care of the linen-closet should include frequent airing and careful dusting of the shelves

and drawers and the keeping of the linen in neat, orderly piles.

Choice of linen.—The term house-linen is used for all sheets, pillow-cases, mattress-covers, napkins, table-cloths, and doilies, whether they are actually of linen or of cotton. In this country linen sheets are too expensive for most families. Many people do not like the cool, smooth touch of the linen, especially in winter. Again, many housewives have linen pillow-cases who do not have linen sheets. The choice between the two depends partly on taste and partly on income.

In choosing sheets care must be taken that they are long enough and wide enough. A sheet should be at least two and three-quarter yards long and three yards is better. Most people, at least in cities, now buy their sheets ready made, because it is more convenient. It is possible to purchase well-made linen and cotton sheets, though the careful buyer can always effect an economy by buying the material and making the sheets. There is the added advantage that the hem done by hand does not catch and hold dust under the edge as the machine-stitched hem does. In selecting either sheets or pillow-cases it is wise to choose those that have been torn rather than cut in the making. The torn ones have truer and more even hems, whereas those that have been cut off are seldom, if ever, cut on a thread and consequently the ends are uneven.

Pillow-cases are procurable in various sizes to

fit various-sized pillows. They may be purchased made of linen or cotton tubing or simply from sheeting. Linen and cotton tubing may also be purchased by the yard for pillow-cases.

Table-linen should be chosen by weight as well as by fineness of threads. Care, however, must be taken that the weight is not due to starch or sizing. Irish, Scotch, and German linens are the most common kinds on the market. Of these the Irish is the finest and also the most expensive. It comes in a great variety of designs. German linen is the cheapest and is perhaps the most durable. The threads are hard twisted so that it has great wearing qualities. It is procurable in good designs, but not a great variety. The Scotch linen stands between these two. It is almost as well finished as the Irish linen and is less expensive. It comes in many very good small designs.

Table-cloths may be purchased by the yard or in pattern lengths. Pattern cloths are always more expensive, but they are also more attractive, as the pattern and border are continuous. Round table-cloths should be avoided, as they are most troublesome. For a round table it is better to choose a table-cloth with a center with a circular design which follows the outline of the table than to choose a circular cloth, as the latter almost invariably stretch on the edges in laundering. Table-cloths with plain linen centers and a simple border of plain linen, with only a simple center design or those with good all-over patterns are

attractive and serviceable. The satin figures or stripes do not wear as well as the ordinary finish. In general, table-cloths with small designs wear better than those with large designs. Napkins should match table-cloths. They vary in size from fourteen to thirty-one inches, according to their intended use.

Marking and mending of linen.—The most attractive way of marking linen is by embroidering in white. This is slow work, and each housewife must consider whether she can afford the expenditure of time. White letter-shapes can now be bought that are quickly embroidered over onto the linen. They are not as beautiful as the embroidery all by hand, but are a compromise for the busy housekeeper.

For any house-linen except that for the table cross-stitching is very acceptable. White cross-stitching may be used, but a good colored marking-thread is more easily seen. Differing colors on towels for different rooms easily keep the same towels for one individual and enable the housewife to use different types of towels, according to the liking of the different members of her family.

Woven name tapes, firmly sewed on, are perhaps the next best. Marking with a rubber stamp and indelible ink or simply writing in pen and indelible ink are lasting, but are never good to look at. These indelible-ink markings may be made on tapes and then sewed on, or they may be made directly on the linen. When the marking is

not ornamental it should be put in an inconspicuous place, but also always in the same place, so that it can be easily found.

A very good place for the marking of sheets is in one corner on the right side of the wide hem. When folded, the mark is on the upper side. In marking sheets it also is wise to have some way of designating whether the sheet is single or double. This can be done by having the letter "S" or "D" follow the name, according to the size of the sheet, or by having a single cross-stitch "period" mark the first, and two the second.

There should always be some way of telling the date at which the linen was bought. If cross-stitch marking is used the cross-stitch "periods" can be used for this purpose. The dates are then given on the inventory list, prominently posted in the linen-closet. There, for example, "x" equals Bought January, 1911; "xx" equals Bought March, 1912; "xxx" equals Bought May, 1913. Such a method of keeping track of wearing qualities is very advisable.

Ornamental marking on pillow-cases and towels should be in the center just above the hem. Other markings on the pillow-case may be on the under side of the hem in the center of one side of the pillow-case. Other markings on towels may be on the wrong side of the hem close to one selvage.

Monograms on table-cloths should be placed so that they will be on the table and near one corner;

there may be two monograms placed diagonally so as to balance. Other markings are most inconspicuous if placed on the under side in the center of one end.

Ornamental markings on napkins must be placed so that when the napkin is properly folded the letter or monogram is well placed on the surface that is exposed. The placing of other markings on napkins is difficult, but if one is necessary a good place is near the hem about one-third of the distance from a corner.

The mending of table-linen is really an art. There are one or two precautions which facilitate matters somewhat, however. The linen should be darned before the threads have broken away—that is, as soon as any weakness is noticeable. Thread as near the fineness and appearance of the linen as possible should be used. The best are the ravelings of the linen which can be made from the good parts of a worn table-cloth. There are some special threads on the market for darning linens. Darns are made from the wrong side. In general the threads are put in lengthwise of the goods first, and then the cross threads are woven into these. Both sets of threads should extend beyond the weak portion, but they should not all extend to the same point, as then the strain which results may weaken that portion. On each turn must be left a tiny loop of the thread to allow for the pulling up of the weaving, and also to allow for shrinkage.

A linen-closet filled with piles of well-cared-for snow-white linen should be the pride of any housewife. Beautiful linen is a precious possession, but where the family income is too small to allow beautiful textures and weaves there is still always possible the snowy whiteness, attractive marking, and perfect order. The impression of shining cleanness is perhaps the most pleasurable of all the impressions house-linen can give, and that is within every one's power.

X

STORAGE SPACES

BASEMENT and attic.—Basements and attics are either or both used for storage purposes. In city houses, however, the basement is more commonly used for storage, as that space is so often useless for other purposes, whereas the top floor of the house can be used for living purposes. The first caution in using either the top or bottom of the house for storage is not to use it for an accumulation of articles which can and will never be used again. To store a lot of useless material requires a great deal of needless care. One of the chief advantages of moving frequently is that one loses all sentiment about retaining everything, if the thing in question is neither useful nor beautiful.

Basements are an important part of the house. Daily care should include ventilating. Weekly, the basement should be swept and dusted like any other room in the house. If it is used for the storage of fruits and vegetables special care should

be taken to examine these so as to discard all decaying ones. The walls of the basement should be whitewashed occasionally—yearly, if possible. This not only makes the walls white and the basement lighter, but also whitewash is a good germicide.

In using either basement or attic for storage a great deal of time can be saved by labeling the boxes and trunks. One method is to attach to the box or trunk itself a list of the articles it contains, written plainly in ink on a card. Another is to number each receptacle plainly and to post in a light part of the cellar a complete list of the contents of each number. A third is to have a card catalogue of articles, giving the number in which each is to be found. The last is far the best method. The number and designation, as "7, tray," "11, lower half," can be written in pencil and erased when a change is made. The main headings, as "Curtains," can be in ink and used year after year. Such a catalogue to one unused to it seems a great deal of work, but it saves hours of time that will inevitably otherwise be spent in hunting for stored objects. The articles may be indexed on a card catalogue and a statement made as to where each is stored. There is nothing more exasperating than to look through box upon box before finally finding some carefully stored article, unless it is to have the remembrance of the exact conditions under which that same article was put away burst upon you just as the

article appears. Worry and nerves, not to mention time, are saved by labeling in some way all boxes and trunks.

The more orderly the methods of storage, the easier will be the cleaning that is necessary to safeguard the health of the family. The housekeeper's calendar should include definite dates on which such cleaning should be done, as in too many houses these out-of-sight places are sadly neglected. All this applies equally to the cellar.

Cupboards and closets.—In the planning of any house thought should be given to cupboards and closets. To have plenty of closets, conveniently placed, with well-fitting doors, means a saving in time spent in cleaning and also means a curtailing of the steps of the housewife.

A preserve-closet is a necessity in almost every house. This should be placed in the coolest part of the basement and it should be painted either white or a very light color. If possible the door should be placed so that when it is open the light from a window reaches the closet. This is not always possible, but it is a good arrangement for any closet.

Labels in all cupboards and closets save time, but they seem all-important in a preserve-closet. The shelves should be plainly marked so that in putting away any preserves no time is lost in deciding where and how to place them.

Vegetable and fruit closets should be also in the coolest and driest parts of the basement. The

contents of these must be carefully watched to guard against decay.

A closet in the basement for the storage of trunks and boxes is also a great convenience. Such a closet may be placed wherever convenient. The trunks or boxes should be placed on wooden horses or elevated in some way so that they are completely surrounded with air. Basements should never be damp, but in case of accidental dampness this elevation does protect the article. It also makes their use easier, as one bends over less.

The butler's pantry should contain dish-cupboards. These should be white enameled and should have glass doors so that one can see the contents at a glance. In arranging a china and glass cupboard great care should be taken to place the most frequently used dishes in the most convenient place, and other dishes should be placed in regard to convenience and frequency of use. Often a shelf of half the regular width put between two shelves—at the back—adds much needed extra storage space for glasses, cups, and other small articles. Where this is not done, a slat run across two inches from the back affords a rest for platters, large plates, and the like, to stand against the wall. Cups are sometimes hung from hooks screwed into the bottom of a shelf, but unless the handling is very careful breakage will be frequent. Labels on the shelves are advisable, especially if several people put away dishes at different times.

A hall closet for holding wraps and rubbers is a great convenience, and it can also be used for storing card-tables. Such a closet needs extra care in cleaning, which should be at least weekly.

Cleaning-closet.—On the first floor there should be a cleaning-closet, in either a back hall, the kitchen, or some other convenient place. The second floor should also have a cleaning-closet. This need not be as complete as the one on the first floor, but to have a few of the most frequently used implements and cleaning-preparations on the second floor is a great economy of time.

The most important points to remember about the care of a cleaning-closet is to put all implements away clean and to keep them in order. Far too often a cleaning-woman uses a mop and then calmly puts it away and proceeds to forget the dirt that she put away with it.

Bath-room cupboard,—This is sometimes built in and sometimes a detachable one fastened on the wall. It should contain as many sections as there are members of the family, and each should have one for soap, tooth-brush, nail-brush, shaving-brush, tooth-paste or powder, and other individual toilet articles. A bath-room used by the whole family where each member must see the toilet articles of all the others while using his or her own, is unattractive, and the exposure of all these articles is unsanitary.

The bath-room cupboard should be white enamel inside and should be washed out weekly,

and each member of the family should help keep it orderly and clean.

Medicine-closet.—This is one of the important parts of the household equipment. "Home doctoring" can never take the place of the trained physician in case of illness, but there are many remedies that should be kept and used in minor accidents and before the doctor arrives.

The place of this closet depends on the arrangement of the house. The main bath-room is an excellent place if there is room.

The cleaning of this closet is of great importance. It should include the throwing away of useless medicines. This means all the odds and ends left of prescribed medicines and any that seem to have deteriorated.

The arrangement of this closet should be such that everything is easily accessible. A closet four inches deep has shelves wide enough. It is not the part of this book to give a list of the contents of such a closet, but one or two warnings must be given. First, have as few poisons as possible, keep on the top shelf, and *mark plainly.* The bottle must, of course, be labeled "Poison," but in addition it is well to tie around the neck of each bottle a tiny bell, whose ringing will mean "Danger" whenever the bottle is touched, even in the darkness. Second, have on the door, detachable if the light is not good, one card giving the antidotes for common poisons and another giving directions for common emergencies.

A good antiseptic for washing small wounds may well be kept out in the bath-room, easily accessible, and its use encouraged.

Bedroom closets.—The arrangement of bedroom closets depends on the size and shape of the closet. In all cases, however, space is saved by having rods on which to hang clothes and to enable the user to see at a glance just where everything is. The position of these rods depends entirely upon the shape of the closet. For some closets the only possibility is to have one long rod lengthwise, and in others several short crosswise rods are the best solution of the problem. An excellent device is the rod in loop form, ten or twelve inches long, which fastens to the inside of the door of the closet near the top. From the lower bar of this ten or twelve full-length dresses or trousers can be hung, and when the door opens the dresses are all swung out into the light and air. The only disadvantage is a possible sagging of the door under the weight hung on it. In practically every closet some arrangement of rods is the best, because the most economical of space.

At a very small expense a shoe-shelf can be placed in any closet. To have the shoes placed in an orderly array on a shelf is surely more inviting than to have them on the floor, where even with the best of care they are pushed around when one steps into the closet to get something else. A shoe-bag can be used, but the shoes do not get

the ventilation that they should have and the bag is a dirt-catcher. An ordinary shelf is good, but a slightly inclined shelf with a ridge about four inches from the inner side to catch the heels, thus keeping the shoes from slipping, is even better. With the shoes thus inclined one can see at a glance just what is there. There is also a device for hanging shoes on a door, a strip of metal with points to catch the heels. Several can be placed on one door if it has not one of the loop-hangers described before. Even then one can be put near the bottom of the door.

A well-built closet in the attic for holding clothes not used frequently and furs is a great convenience. This type of closet is often lined with tar-paper and is sealed as nearly as possible.

All closets should have easily cleaned floors. Except where hard-wood floors are laid, the easiest method is to cover the floors with linoleum, with a quarter molding to hold down the edges. Here oilcloth can be substituted for linoleum, as the wear is very slight.

All closets should be aired when the rest of the house is being aired, and every closet should be cleaned when the room from which it leads is cleaned. Thorough airing and thorough cleaning are quite as necessary for closets as for any other part of houses.

XI

CHOICE AND CARE OF REFRIGERATORS

THE reply to the question, "Why have a refrigerator?" would undoubtedly be, "To preserve our food." But then the query follows, "What are the essentials to be looked for in a refrigerator so that our food may be kept in the best possible condition?" Attractive and well-finished exteriors and interiors are most desirable in refrigerators, as in all other articles of household equipment, but when it comes to the question of preservation of food there are three essential factors—the temperature of the air in the refrigerator, the circulation of air currents in the refrigerator, and the ease with which the refrigerator can be kept clean.

A good refrigerator should maintain a temperature of 40° or 42° Fahrenheit, and it should leave no stagnant-air-spaces. The air in every part should always be in motion. The temperature depends on the insulation of the walls and the tightness with which doors are fitted. The

circulation depends upon the construction of the whole interior.

The walls are insulated to prevent heat from traveling into the refrigerator. In the best refrigerators there are from eight to twelve thicknesses in the walls. These layers are usually of different materials, such as wool, felt, or insulating-paper, each of which is known to be a poor conductor of heat, and also one of these layers, instead of being of such material, is commonly a dead-air-space. In many cheap and poorly constructed refrigerators the only insulation is an air-space.

A poorly insulated refrigerator is no more capable of keeping the interior at a low temperature than a fireless cooker can keep things hot if the insulation is poor or broken. The principle of insulation is the same in refrigerators, fireless cookers, and thermos bottles. In the refrigerator the object is always to maintain a low temperature, but in a fireless cooker or thermos bottle the object may be to maintain either a high or low temperature, according to the contents. In other words, the insulation *maintains* the temperature. In all cases the insulation should prevent the passage of heat. There is, ordinarily, no way for the buyer to judge whether the insulation of a given refrigerator is good, but most reliable makers are glad to show a sample cross-section of the walls, which of course tells the story of the thoroughness of the insulation, and even the

uninitiated can make some sort of a judgment as to its adequacy.

The circulation of the air depends on the openings in the walls between the different compartments. One of the best refrigerators has a series of siphons in the walls so that there is a perfectly free movement of the air all the time. Other excellent refrigerators have one good-sized opening in the walls to allow a free passage of the air. The circulation of air in the refrigerator depends on exactly the same principle as the circulation of air in the house, which is that cold air is heavier than heated air. For this reason the ice-chamber is always in the top of the refrigerator. Thus the air cooled by melting of the ice drops into the compartment below, and forces the air which has become heated to the next section so that there is a continual motion of the air in the ice-box. The heated air gets back to the ice-chamber, where it is again cooled, and again begins its cycle.

We all know that the moisture of the atmosphere condenses on a cold surface; the most common example of this is the drops of moisture that are found on the outside of a glass of iced water. Just as atmospheric moisture condenses on a cold surface, so will the moisture in the air in the refrigerator condense on the ice, so that the air as it leaves the ice-chamber should be both cold and dry. The ice also absorbs odors gathered by the air in its passage through the food-

CIRCULATION OF AIR IN REFRIGERATOR

compartments, and these pass off in the water through the drain-pipe.

Cold, dry, freely circulating air is an essential of a refrigerator. The cold retards the growth of bacteria and the dryness removes the dampness that favors bacterial growth. All decay in food is due to the growth of bacteria of some kind. These are not necessarily harmful to the human body, but they render the food unfit for consumption.

Because the air does circulate in the way described there are certain facts that ought to be observed about the position of the various foods in the refrigerator. Milk and butter, because they may absorb odors and also because they are very perishable, should be in the lowest compartment, directly below the ice-chamber, so that they may have the benefit of the coldest and purest air in the refrigerator. Other articles of food which might absorb odors should be placed in the next compartment, and those articles of food which might yield odors should be placed in the upper compartments. Each dish of food must be carefully covered. Another point to be remembered is that food should never be put in the ice-compartment, since it might absorb odors from the air passing over the ice in circulation. Bottled water may, however, be kept here, that the family may have a supply of cold water without running the risk of putting ice and its possible dangerous bacteria directly into the drinking-

water. If these general rules about position are observed no food in a refrigerator should be contaminated by any other food.

The linings of refrigerators vary according to the prices. The most common linings are galvanized iron, tin, tile, porcelain, glass, and especially prepared enamels. The white linings are desirable because they show the soil so readily and therefore dirt does not have a chance to collect. With the exception of the tile lining, the other white linings—porcelain, glass, and prepared enamels—have no seams and no corners which are hard to reach. The tile linings have, however, the disadvantage of having seams, and there is always a possibility of the cement being broken so that dirt lodges in the crevices, moisture collects, and decay of some kind takes place. The metal linings have the disadvantage of having seams and sharp corners, but they can be kept clean if sufficient effort is made. They have the advantage of being cheaper than the others.

The shelves in a refrigerator are either stationary or adjustable. There is more possibility of change of positions of articles where the shelves are adjustable, and also it is easier to clean them.

The finish of the outside of the refrigerator is important only in regard to its durability and to the ease with which it can be cleaned. In general a polished hard wood is used, but the enameled metal exteriors are increasing in use. These latter,

as they are very hard, smooth, and non-absorbent and at the same time white, are most attractive and easily cleaned. They are expensive beyond the reach of the ordinary housekeeper, but the housewife who cannot afford one must not feel that she is therefore condemned to any lack of "hospital cleanliness." A well-constructed hard-wood refrigerator can be kept as clean as a porcelain or enamel one, and with very little more effort. The better hard-wood refrigerators have the plainest exteriors, with the fewest moldings.

To get the best service from a refrigerator it must be kept well filled with ice all the time. A large refrigerator with a large ice-compartment necessarily means a large ice bill, whether a lot of food is kept in it or not. Many housekeepers practise what they think to be an economy by keeping the ice covered with ice-blankets or paper. This is an extravagance rather than an economy, for the process of refrigeration, as described above, is thereby retarded, and the housekeeper literally does not get her money's worth from the ice. What she saves on the ice bill she often loses several times over on the food bill.

To secure economy, first the refrigerator must be bought with reference to the size of the family —of course not too small, but equally of course not too large—and next must be kept at the maximum of efficiency by keeping the ice-chamber well filled. If the air in the ice-chamber is kept

at 40° Fahrenheit by being well filled with ice, then the air in the other compartments will not be much higher in temperature and therefore there will not be a great quantity of heated air to melt the ice. If the amount of ice is allowed to diminish to a great extent, then the temperature in the other chambers will rise accordingly, and the melting of the ice will be greater because of the increased amount of heated air. This is why, in choosing a refrigerator, the housewife must get one that she will be willing to keep filled all the time. For an ordinary family a refrigerator with an ice-chamber of seventy-five-pounds' capacity is a good size. Such a refrigerator of a good make costs from fifteen to fifty dollars.

Refrigerators of good standard makes can all be fitted with either side or rear doors to the ice-compartment. This means that where the refrigerator can be set against an outer wall which can also be pierced with a door of corresponding size, the ice may be put into it from the outside. This saves the annoying trail of drippings and dirt which an ice-man always manages to bring with him, and also it makes it possible to run the refrigerator without ice during the coldest months of the year by leaving the ice door open. This opening, however, should at such times be carefully covered by fine screening or cheese-cloth to prevent dust from entering the refrigerator.

The place for the refrigerator is important. Formerly the idea of the refrigerator in the kitchen

was absolutely tabooed, but that feeling is gradually losing its hold. With the well-constructed refrigerators of the present day there is no reason why one should not be put where it is the most convenient, whether that be next to the range or whether it be just outside of the kitchen in a hall especially built for it. The temperature in the refrigerator should not be affected by outside conditions unless a door is left ajar.

The refrigerator should not be connected with the house drain unless it is trapped like any other fixture, and even then great care is necessary to see that the seal is kept full of water. If it drains out of the house the piping should extend a distance from the house, and the water should empty into loose stones or rocks.

Care of refrigerator.—

1. Hot or even warm food should never be put into the refrigerator. It will raise the temperature, and with it the ice bill.

2. Every time the ice-chamber is to be filled the remaining piece of ice should be removed and the compartment wiped out, then the ice replaced. The new ice should be in one piece and should be washed before putting into the refrigerator. Where ice is put in from the outside it is particularly important to have clean ice. Artificial ice is much cleaner to use, but it is not always possible to procure it.

3. A set of white-enamel dishes and plates is a great aid to cleanliness. Bowls and oval dishes

of this ware can be turned upside down and used as covers. Cut glass and fine china should never be put there, as the danger of chipping or even breaking is great.

The use of cracked or chipped dishes for food is greatly to be deplored. The rough surface left by the cracks or chips is an excellent place for bacterial growth.

4. Uncooked meat should be kept in a covered enamel dish.

5. Food should never be covered with paper of any kind, with the possible exception of oiled paper, used only once.

6. Milk-bottles should be washed before being put in the refrigerator.

7. Eggs with barn-yard soil should not be put in the refrigerator. Eggs should be kept in a rack or dish with one layer, so they may be used in the order in which they were bought.

8. The contents of the refrigerator should be examined daily, and no stale food left there.

9. If anything is spilled it should be cleaned up at once.

10. The shelves and floor of the refrigerator should be washed every day with a soda solution and the refrigerator should be cleaned thoroughly at least once a week.

In this weekly cleaning all food must be removed. The racks should be removed and washed in hot soapy water or soda solution, scalded, and then dried, and if possible sunned.

The inside of the refrigerator should be thoroughly washed.

The drain-pipe should be cleaned with hot soda or soapy water and with a long-handled bottle-brush. After it is thoroughly cleaned, boiling water should be poured through it. If the waste water drains into a pan, this, too, must be thoroughly washed in hot soda or soapy water and then scalded.

The cleaning of the drain-pipe and pan are extremely important, as they often have a very disagreeable collection of dirt from the impurities of the ice. The dirt may also be quite dangerous, as it is impossible to tell what bacteria may be present in the ice. As long as the bacteria are in the ice their growth is retarded, but when they get into the drain-pipe they have a favorable place for growth, since it is damp, dark, and above the freezing-point. It would be hard to give too much care to the drainage of the refrigerator.

Many refrigerators can be fitted with a water-cooling apparatus. The position and type differ with the make of the refrigerator, but in general they consist of a coil of heavily blocked tin pipe in the ice-chamber, one end of which is connected with the water main and the other end terminates in a faucet in the front of the refrigerator. These are seldom placed in refrigerators of less than one-hundred-pounds' ice capacity. They vary in price also, according to the make. They are a

great convenience because they insure cold water at all times without having to remember to place bottled water on the ice and without having to run the risks which putting ice into drinking-water does entail.

The kind of refrigerator which we choose depends largely upon the size of our pocketbooks, but it is poor economy to buy a cheap one. Because of poor insulation it uses more ice and because of poor circulation and insulation the temperature is not low enough to preserve food properly, so that there may be a waste of food. It pays to buy a good refrigerator even though in the process we have to give up some much-desired article of furniture. A good refrigerator with good care lasts a long time, and it does mean that food is kept in better condition. A poor refrigerator, which does not refrigerate, and which cannot perhaps be kept in a good sanitary condition, is in the end a loss to the pocketbook and may be a menace to the health of the family.

XII

CARE AND REPAIR OF FURNITURE

CAREFUL, painstaking care and repair of furniture means one of the truest economies that the housekeeper can practise, and good repair has a lasting quality that makes it particularly satisfactory. The discouraging side of most household tasks is that they are done only to be undone almost immediately. A room is dusted in the morning, and the next morning the same process has to be gone through again. The dishes are washed only to be soiled again in a few hours. It is this lack of enduring results which sometimes makes household duties so wearying. It is only when the housewife remembers that the result in the family health and happiness is new every time that she finds the repetition interesting. But if one mends a piece of furniture the result lasts for more than a day.

Altogether too few housekeepers attempt such repair. Many a room could be made a more pleasant and livable place if the housewife would

but take her courage in her hands and go at the reconstruction of the furnishings with patience and thought.

What is more unsightly than the broken cane seat in a chair? And nothing is more slovenly than to cover that same hole with a cushion. Even the pierced wood covers, bought and nailed on, are bad, because they are evidently not made to fit. With thought, a small amount of cane, and time, the chair can be recaned by any intelligent woman, or by one of the boys or girls. Caning is a simple process, and the art of simple caning can be learned in an hour. The actual money cost is exceedingly slight when the work is done by the housewife herself, whereas the cost of the simplest caning of a chair by a paid worker is at least sixty cents, and usually a dollar.

The problem of rushing chairs is not so simple, because the rush must be kept wet, it must be pulled very tight, and one should work continuously from start to finish. However, there is a passably good substitute for rushing where time cannot be given to it—that is, to carry out the same process with jute. The jute is much easier material with which to work, as it does not have to be wet and one does not have to work continuously. Coarse jute dyed in a good color—or, better, a color to harmonize with the rest of the room—makes a most attractive chair seat and can be easily and well done by the amateur.

Another thing which any one can do is to glue

furniture. Nothing is more distressing than to sit in a rickety chair unless it is to have one's guest sit in a rickety chair. Either condition is bad, but, fortunately, the cause of uneasiness can be readily removed. The first step is to scrape off the dry glue and leave the surface of the wood exposed. Both surfaces are next covered with a good standard glue and they are then fitted together perfectly. The article should then be tied securely with either soft twine or strips of soft cloth. Excess glue should be carefully wiped off with a damp cloth and the article then allowed to stand for twenty-four hours or until the glue is absolutely dry. Specially prepared liquid glue or the glue that has to be melted over hot water may be used with equally good results.

Too many housewives are content to live with their mistakes or sometimes with their friends' taste. A room with a hodge-podge of furniture in it is distressing, and it surely rests no one to be in it. Has not every one seen a room with one or two pieces each of yellow oak, cherry, fumed oak, and possibly a bit of wicker and mahogany? Each piece is indicative, perhaps, of the prevailing style at the time of purchase, but they surely were not intended for the same room.

If the housewife decides on the color scheme that will best suit the room, some of the jarring pieces at least could be made over into that color. This means first removing the finish with a good varnish or paint remover, next rubbing down with

fine emery-paper, and then applying a good stain or two or three coats of good paint in the desired shade. In painting furniture, to have an enamel paint for the last coat is usually more attractive.

Before attempting to repaint or refinish furniture all removable knobs and handles should be taken off. Sometimes it is possible to remove for good superfluous ornaments, such as glued-on "carving," a fretted top piece to a chest of drawers, or fancy additions to the legs of tables or chairs. Many an unattractive room has been made into a quaint and interesting room by enameling the furniture in a good color, such as a warm gray, a bright orange (for a few pieces), or a good blue. This treatment is particularly applicable to bedrooms.

Decorative designs are often painted on such furniture, but their use requires a good knowledge of design, and it is wiser not to add them unless under the direction of an artist. The ordinary painter or decorator has not the qualifications for such work.

When one considers that many upholsterers in England and on the Continent are women, it is a matter for surprise that so few women in this country even attempt reupholstering. With care it is possible for most women to upholster a chair or even a couch with presentable results. The prime necessities for this task are infinite patience and accurate measuring. Perhaps the best way is first to take off the original covering. The new

covering should be cut, using the old one for a pattern, just as carefully as one would cut a dress. The material must then be pulled and stretched to cover the spaces, care being taken at all times to keep the threads running in the right directions. In tacking the covers on, one must be careful not to mar the woodwork. A very small hammer is best for this purpose. Where the surrounding woodwork is very easily marred, the striking part of the hammer may be covered with a piece of kid, stretched tight. This makes hammering a little more difficult, but lessens the danger of marring if the hammer strikes.

The choice of the right gimp is important where the edges have to be covered by one. Department stores usually carry a variety.

Eternal vigilance is necessary to keep furniture in repair. If the housewife would learn to make each repair just as soon as the need is noticed, her home would gain very much in attractiveness. Moreover, she would take more pleasure in her task because she would know that another piece of repair was not calling her just as soon as the first was finished.

Furniture, like everything else, wears out, at least in spots. With the best of care general repairing is a necessity at times for all furniture. In many cases, however, renovating would be necessary less frequently if furniture were given the proper care at all times. Nothing lengthens the life of upholstery like good brushing and care-

ful dusting. Upholstery with the best of care becomes soiled, because it cannot be washed, and then of course it needs to be reupholstered. Vigorous brushing takes out the dust and breaks up the grease film that holds the dust, and thus, if this is done frequently, there is less opportunity for a layer of dirt to form. Spots of grease can be removed as they are from clothing (Chapter XIX). Sometimes the material is so good that the best remedy for the soiled covering is to remove it, dry clean, and return it to its old place. In such cases a new gimp should be used.

For rattan furniture vigorous brushing is the best treatment to keep it in good condition.

Sometimes finished wood surfaces get dull and grimy-looking. The general treatment of finished wood is discussed in Chapter IV, but in this particular case what is most needed is to remove the film of grease that holds dust and then makes the surface muddy-looking. The best possible treatment for this is to wash the entire surface very quickly with a cloth wrung out of a warm suds of a neutral soap and dry immediately with a soft cloth or chamois; after the surface is absolutely dry it can be rubbed with a good furniture polish, wax, or oil, according to the original finish.

It seems almost unnecessary to caution against the use of gritty dusters, but there are still housewives who are careless about this and mar the finish of furniture by the use of dusters containing

fine particles of solid matter. Directions for dusting are given in Chapter VIII.

Another warning that seems superfluous is one against hitting furniture with cleaning implements. The carpet-sweeper and dry mop in the hands of a careless person are guilty of many scratches on tables and chairs.

Since the modern methods of keeping a house clean have done away with the old "spring cleaning," the housekeeper who finds the early days of April stirring her to a desire for some thorough making-ready for summer might set aside a week when every piece of furniture in turn gets special attention and is put into the best possible state of repair. The results will surprise any housekeeper who tries this for the first time.

XIII

HOUSEHOLD INSECTS AND PESTS

PERHAPS no one movement is more indicative of the feeling against insects in general than are the numerous Swat-the-Fly crusades which are being carried on in so many cities and towns. A general effort is being made to exterminate not flies alone, but all other insects and pests. Formerly flies, mosquitoes, cockroaches, and other pests were looked upon simply as annoyances, but now that so many of them are known positively to be carriers of disease and to be a menace to good health, the feeling of annoyance has become one of determination to get rid of the pests as completely as possible.

The fact that all insects are carriers of disease has not been proven, but many pests have been found guilty. The wise housekeeper in this case holds every one guilty who has not been proved innocent. Even if a bug is not guilty of spreading disease, what housekeeper wants it among her belongings? Even if it does not carry disease

germs, it can do great injury to her possessions and cause loss. In city homes eternal vigilance is necessary to prevent the entry of insects into the home, as there are so many, many possible sources from which they may come. In the country the problem of keeping free from pests is not so great, but it exists even there.

The most universally common insect is the house-fly. These are known to carry, both externally and internally, some disease-producing germs. They have a fondness for all human food, and as they light upon it, it is difficult to tell just what filth they may leave behind.

In the case of flies, as with most insects, an ounce of prevention is better than a pound of cure. The best remedy is to guard against having them. Careful and early screening is a necessity. This keeps them from the house, but breeding-places should be done away with also. Decaying vegetable and animal matter are the best breeding-places for flies, and these should be removed if possible, or they should be disinfected.

The city-dweller must be careful to keep all garbage closely covered and all garbage receptacles clean. In addition to this the farm-dweller must see that the refuse from all parts of the farm is kept covered or disinfected. Every effort must be made to do away with breeding-places.

When it is necessary to rid a house of flies the following ways can be used:

1. On a bright day the house can be darkened

and one window left open, and the flies then driven to the light.

2. Fly-paper, either tanglefoot or poison fly-paper, may be used. The flies are entangled in the sticky paper and die from exhaustion. They are poisoned by the poison fly-paper and either die or are stupefied so that they fall and can then be swept up. Either method is good, but the latter should be used with great care where there are children.

3. Insect-powder, known by the different names of pyrethrum, Persian insect-powder, or buhach, is sold for killing all kinds of household insects. Buhach is a California product and is more likely to be fresh than the Persian powder. At night all the doors and windows of the room are closed and the powder is sprinkled profusely in all parts. In the morning the flies will be dead and can then be swept up and burned.

4. Formaldehyde is also used. The following method has been used successfully: two tablespoonfuls of a forty per-cent. formaldehyde solution and one pint of liquid, composed of equal parts water and milk mixed together. This is placed in small dishes around the room, and, provided no other food is present, the flies flock to it. A piece of bread placed in the solution is an added inducement to the flies.

Where flies gather on a ceiling, as frequently happens in damp warm weather after nightfall, they can be rapidly disposed of in hot soapy water.

A tin cup fastened flat to the end of a stick is half filled with this. The cup is held directly under the fly, which drops into it and drowns.

No matter what the means used for killing a fly, no fly should be allowed to live any longer than necessary for the procuring of the wherewithal to annihilate it.

Mosquitoes.—Formerly night air was considered malarial, but now it is known that not the night air, but the harmless-looking mosquito, is malarial. Thus if the family are to enjoy the air in the evening in safety the piazza must be screened so as to protect them from the mosquitoes which are more prevalent at night than in the daytime.

The best way of controlling mosquitoes is to get rid of their breeding-places if possible. The breeding-place of mosquitoes is water. The best way, then, is to fill up or drain ponds and pools and other bodies of water where mosquitoes are known to breed. If this is not possible, the bodies of water can be kept covered with kerosene during the summer. If an open receptacle of water is a necessity, such as a rain-barrel, that can be covered with a very, very fine netting. Sometimes fish are introduced into bodies of water that can be neither drained nor covered, and these destroy the mosquitoes.

Careful screening is a necessity for keeping out mosquitoes. Strong odors, such as oil of citronella, ammonia, and kerosene are good repel-

lents, but they are never wholly effective. Mosquitoes in the house that have settled on the ceiling may be killed by hot soapy water, as described for flies. No one should go to bed in the summer in any mosquito-infected place without carefully examining the room for any that may have crept in. Both comfort and safety require that they shall be killed before they have a chance to bite.

Bedbugs.—The bedbug is a nuisance of very long standing; indeed, it has been known for almost as long a time as man has used beds.

The ways in which the bedbug is supposed to enter a house are indeed varied. The laundress, the guest, or a member of the family may each unwittingly bring it into the house on her clothes, trunks, or hand-bags. In traveling one has innumerable opportunities for picking up bugs and carrying them home carefully concealed in the folds of clothing. In cities where houses are built close together bedbugs are known to travel from house to house.

The bedbug is one of the insects held under suspicion of being a carrier of disease germs, although no case has been proved against it. It is known, however, that they prefer human blood as food, although they can subsist on other things. They have been known to live without food for considerable periods of time.

The preventatives are to take all precaution against their entrance into the house on baggage,

furniture, clothing, or any other article, and to have cleanliness everywhere, with special attention to clean beds, mattresses, and bedding.

When they have entered the house they must be got out instantly by one of the following means:

1. Kerosene, gasoline, and benzine are old remedies, but very effective. The liquid should be forced into all cracks and crevices with either a syringe or feather. Several applications with intervals of three or four days between should be made so as to reach all bugs which may have been hatched in the intervening period.

2. Boiling water, when possible to use it without destroying furniture, kills the bugs and eggs.

3. A mixture of one ounce of corrosive sublimate, one pint alcohol, and one-fourth pint spirits of turpentine is also good. It is applied like kerosene. It is a deadly poison.

4. Fumigation with sulphur or hydrocyanic-acid gas as described on page 112.

Cockroaches.—Cockroaches are thin brown bugs and there are many species, especially in warm climates. Dark, damp places are favorable to their growth, and for this reason they are often very numerous around closed plumbing. Frequently they keep out of sight during the day and come out of their hiding-places at night when everything is quiet.

Cockroaches seem to be most wary about touching many things which are set to catch them. The following remedies are used:

1. Borax, sprinkled most freely in all cracks and crevices around the sink and on the base-board below the sink, has been used with most satisfactory results. In many cases borax used generously for an extended length of time has driven cockroaches from the premises entirely.

2. Plaster of Paris and flour mixed to a paste is often used. This paste is put in a saucer and near it is placed another saucer containing water. The bugs eat the plaster of Paris mixture, go to the water, and then die.

3. Insect paste and powders are used with varying results. Any of the powders should be used freely, at frequent intervals, and for an extended length of time.

4. Fumigation by hydrocyanic-acid gas as described on page 112.

Ants.—Several species of ants frequent dwelling-houses and cause annoyance. The red ant, the little black ant, the large black ant, and the pavement ant, all have been known to enter houses.

The best method of prevention is to remove foods which attract them, but if this cannot be done the legs of the refrigerator or table holding the food should be placed in dishes of water covered with a film of oil. This is fairly effective, provided the oil is not allowed to evaporate.

Another preventive method often used with success is to put a sponge, soaked in sweetened water, in places where it is known that there are

ants or in places through which they enter. The ants then become entangled in the sponge and can be killed by pouring boiling water over it. Often the number killed in this way is so large the other ants forsake the dwelling.

Clothes moths.—There are three common types of clothes moths—the case-making, the webbing, and the gallery-making. Although they all work differently, nevertheless the methods of control are the same.

One thing that the housekeeper must understand thoroughly is that odors such as are obtained from camphor, cedar, and naphthalene do not kill moths. These all repel moths, but if eggs are already present in the garments the presence of these odors does not prevent their hatching. If garments, thoroughly brushed and cleaned, together with moth-balls or naphthalene, are placed in a cedar chest, these odors keep away moths that are outside. The greatest care must be taken in brushing and sunning clothing to free it from larvæ and eggs before putting away.

Clothing which is used often is not liable to harm from moths. The air, sun, and the motion are excellent factors for keeping clothing free from them. Under these conditions moths have no time to lay their eggs, or, if laid, the eggs do not lie undisturbed long enough to hatch, so that there are no larvæ to eat the material.

The closet in which woolen garments are to be stored should be clean and free from any accu-

mulation of old woolen rags or any other useless articles which lie undisturbed for an indefinite length of time. Such garments furnish a good breeding-place for moths. If there is any suspicion that a closet has been or is frequented by moths it is advisable to spray all the cracks and crevices with gasoline or benzine so as to kill any larvæ or eggs of moths which may be hiding there.

A way which has been used with success for storing clothes is to clean, air, and brush them thoroughly, then place them in a regular suit-box and paste strips of cloth over all cracks and openings. In this way the box is absolutely tight and if there are no moths present when the clothes are put in the box there is no way for them to enter it.

Cold-storage plants for clothing, rugs, etc., are available in all parts of the country. It is perhaps the simplest and best method of storing and at the same time protecting woolen clothing, but is, of course, expensive for the housewife, who can usually afford to pay for such storage only for expensive materials like fur.

Fleas.—In this country alone there is a record of fifty species of fleas, but fortunately they are not all of them annoying to man. Just how many are a source of trouble is unknown, but at least two species, the cat-and-dog flea and the human flea, are troublesome. Of these the former is the more common.

The cat-and-dog flea must be guarded against

by taking care of the pet animals. If they cannot be taken care of they should be eliminated from the household.

To rid a house of fleas if badly infested is not an easy task. In bad cases nothing but the removal of floor-coverings and then a thorough washing of the floors with strong soap-suds, will be of use. Sometimes, however, when a house is not too badly infested, fleas can be gotten rid of by treating with benzine or gasoline. Benzine or gasoline is sprinkled on the carpets, and it is also forced into cracks and crevices. In using either care must be taken that no flame is near.

Fishmoths.—This insect has many names—silver-fish, silver-witch, and bristletail. It is a long, slender, silvery-white insect and darts hither and thither at great speed.

It is believed that its greatest fondness is for starchy and sugary materials. For this reason it attacks wall-papers, starched clothes, and books.

Buhach powder is often found effective in combating the fishmoth, provided it is used freely enough, but a more common method is to place a paste poisoned with arsenic wherever they are known to be. The starch in the paste attracts them and the arsenic kills them. This paste must, of course, be inaccessible to children or pet animals.

Centipede.—The insect commonly called centipede is long and slender, with numerous pairs of legs. It moves very quickly, so that it is almost

impossible to catch one. They flourish in damp, dark places, so that the best preventative is dryness. Their bite is poisonous. They feed mostly on other insects, and are especially fond of flies, bugs, and roaches.

Carpet-beetle, buffalo-bug, or buffalo-moth.— Buffalo-bugs are misnamed, as they are really beetles. They are about three-sixteenths of an inch in length, with a general background of black which is spotted with white and has a red line down the middle of the back. The larvæ of the buffalo-bug cause the trouble, and not the bug itself. In general, the larvæ gnaw holes in the border of carpets. Sometimes they follow a crack in the floor and cut a slit in the carpet just as neatly as one could with a pair of sharp scissors. They not only attack carpets, but woolen materials as well.

If a house has become infested, buffalo-bugs are practically impossible to control if one insists upon having carpets tacked down. On floors but partially covered with rugs, buffalo-bugs do not find hiding-places suitable for their development. If a floor must be entirely covered, then the carpet should be but loosely tacked so that the edges can be lifted frequently and examined for bugs. Their favorite habitat is just at the edges of the carpet. With the passing of carpets and the consequent increased use of rugs that can be taken up frequently, the buffalo-bug will become less and less of a pest.

Generous spraying with benzine, gasoline, or kerosene is an effective weapon in combating the buffalo-bug. Woolen materials and furs can be protected from its ravages in the same way as they are guarded against clothes moths. Fumigation by hydrocyanic gas or sulphur is good.

Mice and rats.—The best prevention against mice and rats is to fill up the holes and passages through which they enter the house. The holes can be filled with glass and then covered over with metal. If all food is covered and no crumbs are left about there is less likelihood of many guests of this family.

If their place of entrance cannot be filled up, traps can be set, and many of these are very effective. There are small spring traps on the market that are easy to set. There are also preparations on the market which can be put on any bait which is set for mice and rats. These preparations are said to be poisonous to mice and rats only. It is also claimed that these preparations cause them to disintegrate without any odor.

Mice and rats are very wary, and frequently refuse to enter a trap in which one of their number has been caught, however tempting the bait. Sterilizing the trap with boiling water will sometimes remove this difficulty.

Cheese is the most common and best bait for the trap. It is more humane to choose a trap that kills the animal instantly, but those with strong springs must be handled with care. They

should be set near the possible entrances, or near a clear wall, as mice and rats usually run close to the wall.

A cat that is a good mouser will usually keep a house clear of mice.

Squirrels.—Squirrels can cause much damage if they get into a house, as their sharp teeth work very quickly. They enter by windows or any other opening. The only way to guard against them is to close up the passages through which they enter.

Hydrocyanic-acid gas fumigation.—Hydrocyanic-acid gas has been used effectively against household pests, and its use is growing, but there is one most important thing to remember about it—it is a deadly poison, and therefore it is impossible to exercise too great care in its use.

The house to be fumigated must be vacated, and any foods that are likely to absorb gas should be removed. Nickel and brass objects must be removed or completely covered with heavy cloths. In attached houses extra care must be taken, as the gas has been known to pass through cracks in the walls.

Hydrocyanic-acid gas is generated by combining definite amounts of potassium cyanide, sulphuric acid, and water. Pure potassium cyanide should be used, but the sulphuric acid may be only the commercially pure. If a room is closed tight one ounce of potassium cyanide for every one hundred cubic feet of space is enough. The

proportion of ingredients is one ounce potassium cyanide, one fluid ounce of commercial sulphuric acid, and three fluid ounces of water. After taking the measurements and finding the number of cubic feet in the room, it is easier to work on the basis of even hundreds. For instance, if a room contains thirteen hundred and seventy-five cubic feet, it would be well to work on the basis of fourteen hundred cubic feet.

After sealing the room completely, the water should be placed in a stone jar, and this may be placed on several thicknesses of old carpet or paper to protect the floor or floor-covering from any possible accident. Then the sulphuric acid should be poured slowly into the water. This process must *never* be reversed. The cyanide should be measured and placed in a paper bag. Before proceeding, the person doing the fumigating should be sure that all his wraps are out of the room and that the door is open so that he can make his exit most promptly. After these preparations the operator, holding his breath, should drop the bag of cyanide into the acid and leave the room as quickly as possible, closing the door after him. The room should remain closed six or eight hours.

At the end of this time the windows and doors may be opened from the outside. Three or four hours after opening the room enough gas should have escaped so that a person can enter the room in safety. However, the room should not be

occupied until the odor has entirely disappeared.

The contents left in the jar should be emptied into the sewer or absolutely destroyed in some way. The jar should then be thoroughly washed.

Hydrocyanic-acid gas fumigation should never be attempted except by a most careful person, and then directions must be followed and every precaution taken.

Sulphur fumigation.—For sulphur fumigation at least two pounds of sulphur should be allowed for every thousand cubic feet of space. The sulphur should be placed in a metal receptacle set on bricks in a tub of water so that there will be no danger of fire. After sealing the room completely the sulphur should be ignited and the operator should leave the room promptly, closing the door after him. Sulphur candles are often used for this purpose. If ordinary sulphur is used it is well to add a small quantity of alcohol to it—about two tablespoonfuls to each pound—so that it will burn more completely. The room should be kept closed for six or eight hours.

Sulphur fumes bleach some fabrics and wall-papers, also tarnish metals.

XIV

CLOSING A HOUSE. MOVING

TO close a house and get a family started on its way for trip or vacation without a last-minute scramble is a real art. This is a time when forethought is most valuable. To make definite plans before the day of departure means freedom from worry and "nerves" on the day itself.

The first thing to be kept in mind is to have everything as dry as possible, and in such a condition that it will remain dry. Every place where there might be moisture should be examined and the pan under the refrigerator must never be forgotten. If the housekeeper can be sure that her house is dry she can be sure that insects will find it unattractive.

The water-supply should be turned off. If this is done there will be no possibility of the entrance of water into the house, at least through the house plumbing. The housekeeper can usually turn the water off herself, and should learn to do so. Then this can be done at the last moment, whereas if a

man comes from outside it is difficult to arrange so that the family has water for washing hands up to the moment of departure.

Then, again, the trap of every fixture must be left full of clean water, so that there will be no possibility of the entry of sewer gas into the house. Moreover, if the house is to be left for any length of time there is always possibility of the water in the trap evaporating simply from the circulation of air in the system. For this reason it is well to pour a small amount of oil into the drain-pipe of each fixture. This oil forms a film over the water in the trap and prevents evaporation. A heavy oil, such as crude-oil or cottonseed-oil, should be used.

In closing a house in the winter the plumbing requires more care because the traps should be drained of water entirely. Otherwise the water in them may freeze and the trap then burst. In this case the trap is drained and then usually stuffed with paper to prevent sewer gas from entering the house. This draining of traps should be done by a plumber.

The refrigerator should receive special attention. It must be emptied entirely, washed thoroughly, and left absolutely dry. Food cupboards should also be cleaned, and all food receptacles should be washed, scalded, and dried.

Garbage pails and receptacles should also be thoroughly washed and dried. This is quite as essential as the cleaning of food receptacles.

The water should also be drained from the water-front in the range, the hot-water boiler in the kitchen, and the boiler in the basement.

Moist places that are sometimes forgotten are umbrella-stands and vases that have contained flowers. These should both be left clean and dry. Plants, of course, should be disposed of in some way.

Upholstered and wicker furniture should be protected by heavy coverings.

Books on open shelves and pictures not covered with glass should be carefully covered with paper. Any picture or other article that can be faded should be covered, as even a moderate light for weeks or months may effect some deterioration.

Fireplaces and ranges should be cleaned out and the dampers closed.

Gas and electricity meters should be cut off and the telephone also should be disconnected. The first two the housekeeper can learn to do, but it is better to ask the company furnishing the gas or electricity to send a man for the purpose, as there then can be no controversy as to date or possible imperfect stopping of the current. The telephone company should be notified in writing of the date on which service is to be discontinued.

Rugs are better left on the floor, as when they are taken up and rolled insects find just the kind of dark, close places that they like. Some people take the precaution of placing sheets of tar-paper between the rugs and the floor. Other people

sprinkle rugs with camphor or naphthalene. Either one simply acts as a repellent to insects.

Window draperies should be taken down, and if washable they should be washed, but not ironed, before storing. If not washable they should be thoroughly brushed and aired before putting away. In leaving curtains or any other material, it is better to leave them free of starch, as the starch yellows them and, moreover, may attract some insects.

The bedding should be thoroughly brushed and aired. It is wise to wrap it in newspaper to protect it from dust. Mattresses should also be cleaned and covered with paper.

All windows must be closed and locked. Unless the house is very well built it is wise to lay a fold of newspaper across the window-sill and projecting out past the window-sash when closed. When the window is dropped on this and locked, dust cannot sift in as it does otherwise.

Shades should be drawn, and wherever it is desirable to have the room dark the whole window space may be covered with some dark material.

If every one who has to close a house would but make a list of the things which need to be done and would cross off each as accomplished, much unnecessary worry would be saved. If the housewife can simply prove to herself, by looking at a card, that she has done all the necessary things, then she and her family will be saved the annoyance of her wonderings whether or no she has done

this, that, or the other thing. Such certainty is a relief to the family as well as to the housewife.

If the closing of a house means moving, then packing-cases and barrels should be numbered and an index of contents made. The marking of barrels and boxes at that time saves hours of work later. With this method it is possible for any one to unpack the goods so that the useful and necessary articles are the first unpacked. To be in dire need of a saucepan and, upon opening a barrel which one thinks contains kitchen utensils, to find a Russian brass jardinière is enough to dampen the most ardent spirit.

A plan of the placing of furniture in the new dwelling should be in the hands of the member of the family who is there to receive the goods. The simplest way is to have a plainly written number, on a card of a color to catch the eye, fastened to each piece of furniture. Then on the plan of the house—which needs to be drawn only roughly—the corresponding numbers will show where each piece is to go. A moving planned in this way can be accomplished quickly and with little wear and tear on either nerves or furniture.

The house vacated should be left clean and in the same condition one would like to find the new habitation.

XV

THE LAUNDRY

MONDAY has always been the day set aside for washing. Would Tuesday have acquired the cognomen "Blue Tuesday" if it had been chosen for that task? Tuesday is really the better day. Clothes soaked overnight are much easier to wash than unsoaked ones. If clothes are to be washed on Monday some one has to end her day of rest by putting them to soak on Sunday night. Part of Monday may be wisely spent in sorting clothes, mending (since tears grow in washing), taking out stains, and putting badly soiled white clothes to soak. If the preliminaries can be done before, and without that awful feeling of rush, then Tuesday, even though wash-day, should not be a "blue" day.

Indeed, many a housewife who has the family washing to do and finds the task a heavy one for her strength would find the worst of its difficulties vanished if she would wash on two or three days instead of one. Woolen materials, which require

such special care, may then be done on a special day, white clothes on another, colored things on a third. By such an arrangement the pleasure of seeing things come clean can be enjoyed without the overpowering weariness that often destroys it. Moreover, the family meals and the family peace of mind need not be disturbed by the "wash-day" clouds. It is a foolish tradition that the "good housekeeper" must always finish in one day. The good housekeeper's first concern is the health and happiness of her own family, and to preserve both she must avoid getting overtired (which usually means cross) herself. She will plan her work so that neither the family nor herself will dread any particular day of the week.

Mending.—The mending needs a special word. There is no place where a stitch in time will spare the nine so often as in clothes sent to the laundry. This mending is frequently neglected because the handling of soiled clothes is a disagreeable task. The first solution for the difficulty is *not to let clothes become very soiled.* Attention cannot be called to this point too often.

However careful the housewife may be in directing frequent changes of clothing, there will always be some clothes—especially those worn by children and field-workers—that are disagreeably soiled. Badly soiled clothes are particularly unpleasant to handle. Most women will prefer to

have greater wear and tear on such clothes and more work later rather than to mend them before washing. But the bulk of the washing—all table-linen, bed and house linen, and most outer garments—can be mended before laundering. The sorting of the clothes should be done in a good light room where sewing-materials are at hand and the stitches taken at once. If the laundry itself is the place where the sorting goes on, there should be included in its equipment a well-equipped sewing-box.

If buttons are loose it is well to cut them off before washing and leave them to be sewn on after, as they are always in the way in wringing and ironing.

Ribbons for underwear should be invariably removed. If this is too much trouble—and it frequently takes a good deal of time to put them in again—ribbons should be discarded, and linen bobbin substituted. Where the linen bobbin is used it should be fastened in the middle of the back, as it is not to be removed for the laundry, and such fastening insures against the trying possibility of losing one end of the tie. It may be noted that the ends for undervest, chemises, and corset-covers should tie at a point half-way between shoulder and front, rather than in front, where the ends are likely to stick up and show under thin materials such as are much worn for yokes and fronts.

Sorting.—Clothes for the laundry must always

be sorted. A good way is to arrange them in the following piles: (1) table-linen, (2) bed-linen, body-linen, towels, and handkerchiefs, (3) colored materials and stockings, (4) kitchen towels and cloths, (5) flannels and wools, (6) embroideries and laces.

Even for the housewife who clings to tradition, embroideries and laces may be held an exception and washed on a separate day, since they should be ironed or pinned out while wet.

Soaking.—White clothes should be soaked, as is stated later. In soaking clothes, if three tubs are available, table-linen should be placed in one, bed and body linen in another, and dish towels and cloths in another. These last need soaking most of all and the first least of all. Handkerchiefs, especially if colds are prevalent, should be soaked by themselves in a pail of water containing salt or boracic acid. Clothes may be soaked by placing in soapy water, but a better way is to wet each article, soap the badly soiled parts, and then roll the soaped parts inside, pack in a tub, and cover with warm soapy water. This method keeps the soap where it is most needed and prevents the water from washing it out.

Washing.—The suds for washing should be warm and clean and should be changed as often as necessary. It is a great fallacy to believe that clothes can be washed clean in dirty water. Warm water also expands the fibers, so that the dirt is loosened. The wash-water should be kept warm by frequent

additions of hot water. If the water is allowed to cool, more rubbing is necessary. The clothes to be boiled should be washed in the following order: (1) table-linen, (2) bed-linen, (3) towels, (4) body-linen, (5) handkerchiefs, (6) kitchen towels. All clothes should be washed on the right side first, then on the wrong. Soiled clothes need rubbing, and this should be done so that the material gets the benefit of the friction and not the hands only. The material must always be between the board and hands, and, while rubbing, it should be gathered up in the hands and then turned and rubbed on the other side. Clothes must be clean before putting in the boiler.

The boiler should contain cold water and finely shaved soap or soap solution. The latter is the better, as it forms a suds more quickly. The clothes are placed in this and brought slowly to the boiling-point. Boiling for ten minutes is sufficient for ordinary clothes, as germs that make ill-smelling clothes are killed with this amount of boiling. Disinfecting because of disease germs requires longer boiling, but this is usually done under a physician's directions.

Sometimes kerosene, turpentine, or paraffin-wax is used in the boiler. They are all used in the proportion of one tablespoonful to two gallons of water. Unless most carefully rinsed, the odor remains in the clothing. Each boiler of clothes should be started with clean cold water. Boiling sterilizes and whitens clothes, and all white clothes

should be boiled frequently, especially when they do not often get the full sunlight in drying. Clothes should be drained or wrung from the boiling water and placed in clear warm water. If placed directly in cold water the soap hardens on the material and is difficult to remove. Two or three rinsing-waters should be used. The more rinsing-waters, the whiter the clothes. Washing-machines are excellent for rinsing.

The clothes are then blued and starched if they require starching. The directions for both are given later.

Colored clothes and stockings are washed last in clean suds of neutral or mild soap, according to the directions given later.

Drying.—In hanging out, like pieces should be put together, the threads of the cloth should be straight, and all articles should be wrong side out. The more carefully they are hung, the fewer wrinkles there will be to iron out. In removing from the line they should be folded before putting into the basket. If crushed into it, there will be unnecessary wrinkles. As soon as possible they should be dampened, hems, edges, and selvages turned in, rolled tightly, and left to stand at least a few hours and preferably overnight. Then they are ready for ironing. Sheets, pillow-cases, towels, and underclothing should be dampened only slightly. Table-linen and starched pieces should be very damp.

Ironing.—Before beginning to iron, the board

should be put in good condition, the irons cleaned, the iron-stand and wax put in a convenient position, and a soft cloth and small bowl of water placed so that it can be easily reached for additional dampening. As the heat grows more even, the iron becomes smoother. For this reason it is well to iron the coarser things first. Starched clothes require the hottest irons. Every article should be ironed dry and then hung to air.

Ironing is more than simply pushing an iron over the surface. The stretching of the material in the right, and never in the wrong places, is of great importance. Pressure is also important, especially where a gloss is desirable on the finished surface. Part of this pressure is provided in the weight of the iron, but more must be supplied by the body weight of the ironer. She should have the table of such height that she can use her body weight for pressure without undue strain on wrist or shoulder.

Care should be taken in folding the ironed clothes according to special directions. Folding does not improve the appearance, but it is a necessity in storing them. If well done, folding need not mar the appearance.

Surely a good deal of the drudgery can be taken out of laundry work if more thought is given to the planning of the details of the equipment of the laundry and the general plan for doing the work. Some attention on the day before the washing is to be done must be part of the plan.

If each housewife will take the time to work out her own laundry problem instead of being content to go at it in a hit-or-miss style none of them need sigh deeply simply at the mention of washing and ironing.

XVI

THE LAUNDRY: EQUIPMENT

MANY a time the remark has been made that the civilization of any country can be measured by its cleanliness. This cleanliness includes persons and possessions. There is more truth than fiction in the statement, for we always find that the more civilized people are, the greater is their demand for cleanliness. And so much is this true that social workers realize more and more that one of the best methods to set on his feet again a human being that is "down and out" is to start by providing that man or woman with a clean body, clean clothes, and clean surroundings. This is why housekeeping centers and city cleaning crusades are being heard of more and more.

Clean clothes are an essential part of this crusade for cleanliness. Considering the great importance of laundry work, few housewives have given it sufficient thought. Washing and ironing are necessarily harder than some other household

tasks, but they can be made easy enough for any woman of ordinary health and strength if proper attention be given to the position and equipment of the laundry and if the housewife attacks the work with the right attitude of mind and body. A long walk is tiring if one walks bent over, with short steps, and it is almost as tiring if the walker starts out with the conviction that she is going to be exhausted before she reaches her goal. So also a washing, whether it be very small or very large, will be distressing if the washer is forced to bend over all the time or if she is sure beforehand that it is going to weary her.

It is seldom possible for the housekeeper to choose the position of her laundry, as she usually has to take what is already arranged in the dwelling that she rents or buys. If she has the good fortune of planning her own house, then she should give as much thought to the planning and equipment of the laundry and kitchen as a carpenter would to his workshop. A good carpenter sees that his bench is placed in a position to get good light, and he also has a care about its height. The essential features of the laundry—the tubs, the table, and the stove—should also have the advantage of the best possible light, and they should be placed at a height convenient for the person who is to use them most.

It is far preferable to have the laundry work done out of the kitchen. It is not pleasant to think of food being prepared in a room containing

a collection of soiled clothes or in an atmosphere laden with steam and laundry odors. It is better to have a small kitchen and a small laundry. The laundry may be on the first floor or it may be in the basement. To utilize basement space for a laundry is often more economical, for it means no additional floor space, and also it is usually cheaper to install the plumbing. It is a saving of steps, of course, to have the laundry on the kitchen floor, but in that case it is well to have it separated from the kitchen by a small hall or closet, to prevent the steam and odors passing too freely.

In whatever position the laundry is it should have plenty of light and be well ventilated. Who can do her best work in an atmosphere heavy with steam and odors? Who can see whether or no clothes are free from spots unless she has plenty of light?

The laundry tubs should be placed with reference to the windows rather than with reference only to the stacking of the plumbing in the house, as often happens. If tubs are at the right height, so that the washer can stand fairly erect, and if they are in a good light, so that there is no straining of the eyes, washing becomes much less of a physical strain. It is better to place tubs too high rather than too low. For a low tub there is no remedy except having it raised, which entails quite an expense, but if it is too high it is always an easy matter to arrange something on which to stand. A movable floor

of slats with cross-pieces underneath is good for this. No tub should be set lower than thirty-four inches.

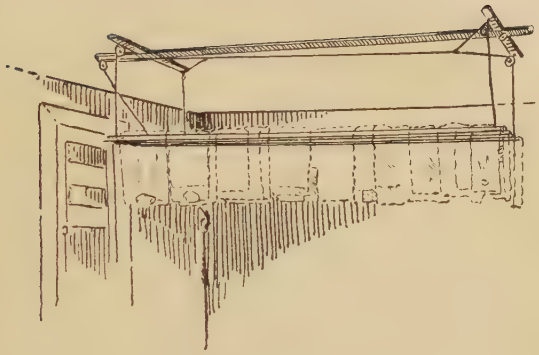
Floors.—The common materials used for laundry floors are hard and soft wood, tile, and cement. Hard wood is good, as it is easily cleaned and does not absorb water readily, but it is somewhat expensive. A soft-wood floor is not easily kept clean, is more absorbent, splinters and roughens with use, but is less expensive. Tile is durable, non-absorbent, and easily kept clean, but it is hard and cold. Cement is perhaps the most satisfactory flooring. It is not prohibitive in price, is durable, easy to keep clean, and can be made almost non-absorbent by painting with special cement paint. In order to do away with the difficulty of standing on a hard, cold surface, rubber mats may be laid where the worker stands, but if water is splashed on the floor there is danger that the mat or the person standing on it will slip.

Tubs.—There should be at least two tubs, and three tubs are much better. Various materials are used for laundry-tubs, of which the most common are soapstone, slate, alberine, porcelain, and enameled iron. Soapstone and slate have the disadvantage of having seams and of being dark in color. Soapstone has an absorbent surface so that it requires especial care to keep it in good condition. Slate is fairly non-absorbent. Alberine, porcelain, and enameled iron tubs are

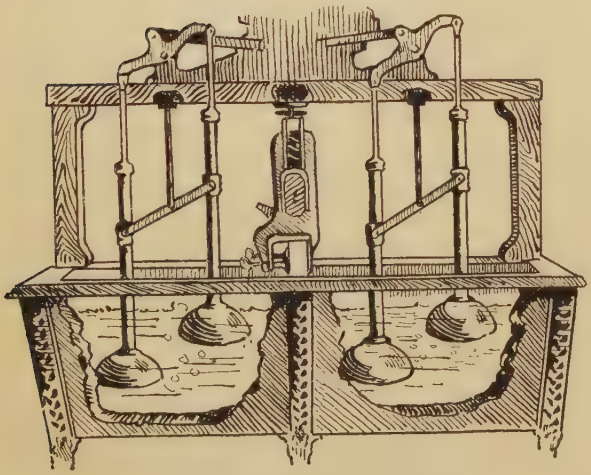
smooth, seamless, and non-absorbent, and they are being used more and more.

Where stationary tubs are an impossibility, portable tubs must be used. These are made of galvanized iron, fiber, and wood. The wooden tubs are perhaps the hardest to keep in good condition. In order to have them hold together they must be kept damp, and as dampness is favorable to the growth of bacteria, the tub may not be as sanitary as it ought to be. Fiber tubs are especially desirable because they are smooth, seamless, and light in weight. Galvanized-iron tubs are fairly good, and cheaper than the others. Portable tubs are easily filled by using a piece of rubber hose attached to a faucet. After using, any tub except the wooden one should be wiped dry.

Wash-boards.—For very soiled clothes a wash-board is necessary, since pounding and friction loosen dirt. The wash-board is of metal or glass, or it is sometimes molded into the side of the tub and is then of the same material as the tub. This last is not advisable, as it is often too low and almost always at a poor angle. After using, the board must be wiped dry. Glass wash-boards must be protected from sudden change of temperature. The present-day wash-board has evolved from the rough stones on which primitive people rubbed their clothes. In some countries clothes are still cleaned by rubbing or pounding on rough stones in streams of water.



OVERHEAD DRIER



VACUUM WASHING-MACHINE

Washing-machines.—The tubs and wash-boards are being replaced in many homes by washing-machines, and where one of these is chosen wisely there is a great saving of time and energy. Washing-machnies come in many styles and in a corresponding range of prices. They help the cleaning process in one of two ways—either by friction or by compression and suction. This latter principle is being used more and more, as the clothes are cleaned with but little wear and tear on the fabric. In general, this type, which is commonly called a vacuum washing-machine, is conical in shape. The theory is that as it plunges into the clothes the air pressure within the cone is reduced below that of the atmosphere, and the greater pressure on the outside forces the dirt up into this so-formed partial vacuum. Washing-machines may be obtained from one dollar and fifty cents to one hundred and fifty dollars.

These washing-machines may be attached to portable or stationary tubs or to the boiler. They also come attached to a special tub, and then are of special value where there are no set tubs. They are as useful for rinsing as for washing. They are equipped for running by either hand, gasoline-engine, water-motor, or electrical power. They are a great time and labor-saving device, and should be more generally used. Although many of the washing-machines are very expensive, it is possible to get a useful one at a low price.

Wringers.—Wringers not only save the strength

of the laundress, but they also prevent wear and tear on the clothes. Hand-wringing necessarily strains the fabrics more than the pressure of rollers. Wringers may be run by power like washing-machines. After using, the rollers should be loosened so that they will not become flat. Like any machine, the wringer must be oiled occasionally to work easily. The rollers darken with use. This condition can be overcome by rubbing with kerosene, but as the kerosene cleans by dissolving the surface rubber, it is most important that the rollers be washed off thoroughly after the application of oil.

Boiler.—A good boiler has at least the bottom of copper, and the best boilers are all copper. This is because copper is not only durable, but also transmits heat more readily than tin.

Irons.—Irons come in a variety of shapes, sizes, and weights, according to their intended use. If heated over a stove, at least three irons are necessary for efficient work. With less, one almost invariably has to lose time waiting for them to heat. They should be of assorted weight; eight-pound irons for table and bed linen, six-pound irons for ordinary garments, and three or four pound ones for thin garments. These are obtainable in the old-fashioned types with attached handles, or with adjustable handles. These latter are very convenient, because an iron-holder is not needed. Very small irons are useful in ironing articles such as baby dresses.

Ruffling-irons, which are very slender and pointed, are useful for gatherings. For giving finish to collars and cuffs a polishing-iron is excellent. This is an iron with a corrugated surface, so that more friction is obtainable. A fluting-iron may be added to the collection for crimping ruffles. A good equipment for a family is:

1 eight-pound iron	$ .40
2 six-pound irons, at 30 cents	.60
1 three-pound iron	.25
1 ruffling-iron	.25
1 tiny iron	.15
	$1.65

The use of irons heated by electricity, gas, gasoline, and alcohol is increasing. These have many advantages in their use. They give an even, continuous heat, and can be used independently of the condition of the fire in the range; they save steps, and they can be used in the coolest part of the room. Their use is naturally increasing rapidly, and is to be encouraged.

Mangles.—Mangles (ironing-machines) are gaining in use. They give good results with flat work and for garments without buttons that can be ironed flat. There are two types of mangles: (1) the cold-roll mangle has rollers made of wood which are not heated. The weight and pressure of these rollers are depended upon to take out the wrinkles. (2) The hot-roll mangle has one roller

which is cold and padded like an ironing-board, the second of iron and heated. Wrinkles are removed by heat as well as by pressure and weight. The right side of the article is placed next to the metal roller, so that it may be polished. The metal roller should be waxed like an iron to get good results. The heat may be supplied by electricity, gas, gasoline, or alcohol, according to the make. Mangles may be fitted to run by a belt, hand power, or a motor. In using any mangle great care must be taken to feed the articles evenly, otherwise they cannot come out in their original shape. Mangles, like any machinery, require oiling to run smoothly. Each housekeeper must calculate for herself whether the time and energy saved by the use of a mangle justify the expenditure. Those for the home cost from thirty to two hundred dollars.

Tables and boards.—There should be a good firm table in the laundry. It is of general use and can be used advantageously in ironing flat pieces. For this purpose it must be well padded and firmly covered with heavy cotton. Blankets make excellent padding. Skirt-boards may be boards alone, to be supported by whatever is convenient, or they may have a special standard. The latter are made very firm and are excellent where it is possible to leave a board always standing. Ordinary skirt-boards are often firmly hinged to a wall, and when not in use they can be hooked back. In that case there may be folding legs to

support the outer end, or that end may rest on chair or table. Sometimes it is possible to have them hinged in a closet so that when not in use they can be concealed. Thirty-one inches is the right height for the ironing-board for a person five feet six inches tall.

Sleeve-boards are not only useful for ironing sleeves, but also for ironing many small garments. Any ironing-board, large or small, must be well padded and must have a firm, clean, cotton covering. The cover for the skirt-board is best fitted with tapes so that it can be tied on. This method is more satisfactory than tacking or pinning, as the covers are more easily removed for laundering.

Stoves.—A stove on which to make starch, heat the boiler, and heat irons is necessary. A two-burner gas-plate serves the purpose very well indeed. Stoves especially constructed for laundry purposes are also available. These are made for both coal and gas.

Drying.—The most satisfactory clothes-line is of rope. When not in use it should be taken down and kept covered. If this is impractical, it must be most carefully wiped with a damp cloth before hanging clothes on it, as a clothes-line can collect an amazing amount of dirt and dust. Clothes are much better dried out of doors, where the sun and air reach them freely, but when that is not possible they can be dried on ropes inside, or on especially constructed drying-frames. Some of these frames can be worked by ropes so that they

may be lowered while filling and then raised to the ceiling, so that the clothes are out of the way while drying. This type of drier is especially useful where the kitchen has to serve as laundry too. It is also a useful place to keep dish-towels out of the way. Such a drier can be had for five dollars. Drying-closets, heated by steam, electricity, gas, or coal, are very good, as they make quick-drying possible, but they are too expensive for the ordinary house.

Clothes-pins.—The old-fashioned wooden clothes-pin still holds its sway. Patent clothes-pins usually have some metal around them, so that in time they are affected by the weather, corrode, and break. They also often cause rust spots on the clothes. Clothes-pins should be kept covered when not in use, to protect them from dust. A clothes-pin apron is a very convenient article. It is a small apron made of a heavy material like ticking, the bottom of which is turned up to form one large pocket or two smaller pockets for clothes-pins. It is a great help to the laundress in both hanging up and taking down clothes, and is also a good place to store the clothes-pins when not in use. Clothes-pins should receive occasional washings so that their cleanliness may be assured.

Baskets.—A clothes-basket is necessary, and two are a convenience. The willow clothes-basket still stands first in number used. These must always be lined with cloth or paper (white oilcloth is best) before placing damp clothes in them, as the

willow may cause a yellow stain on damp clothes. Willow hampers for soiled clothes are also used more than any other kind, but their use is being questioned more and more. A receptacle of enameled fiber or metal, which can be easily and thoroughly cleaned, is more sanitary. Every other receptacle receives at least an occasional scouring, but how often are willow hampers cleaned? A willow hamper should be lined with a bag of heavy washable material, such as canvas, which can be removed and washed with the soiled clothes. This helps materially in keeping the hamper clean. It is distressing to think of the great number of places there are for dirt and germs to lodge in wicker.

Other equipment.—A clothes-stick is necessary for stirring the clothes in the boiler or tub. A broomstick is excellent, or a stick with a pronged end, made for the purpose, may be bought. Some type of sprinkler is a great convenience. A whisk broom, a brush with bristles on only one side, and a bottle with an adjustable perforated top are all good. Any good sprinkler dampens evenly with small drops of water.

For fringed articles a fringe-brush is a help, as it is less harsh on the material than an ordinary brush. The bristles slant so that they do not dig into the material and therefore do not pull out so many threads.

An iron or asbestos iron-stand on which to rest the iron when not in use is essential. An iron-

stand should be raised enough so that the material beneath will not be scorched by the iron. For the old-fashioned iron an iron-holder is necessary. These may be made of any firm material. A removable cover is advisable, as this can be washed easily, while the cover cannot. The best shape is oval. The cover is best made with one side whole and the other side of two pieces overlapping a half-inch in the center. Through this opening the pad can easily be slipped in.

A clothes-horse on which to hang clothes after ironing is essential, so that garments may be well aired and absolutely dry before storing.

A laundry with its own equipment of utensils saves many steps. It is poor economy to add to the burden of wash-day by having to run to the kitchen for a cup, a spoon, or any other utensil. A laundry ought to contain the following:

- 1 pail
- 1 dipper
- 1 dish-pan
- 1 small bowl
- 1 saucepan of about five-quarts capacity for making starch
- 1 teakettle
- 1 case knife
- 1 teaspoon
- 1 tablespoon
- 1 one-half-pint cup
- 1 quart cup
- 1 large wooden spoon

The utensils should be made of materials which will not rust. Enamel is very satisfactory, and white enamel helps make the laundry look light and bright.

The amount of equipment which a laundry

should contain depends on the amount of laundry work done in the house. Where it is all done in the house everything which will lighten the labor should be included in the equipment. As with all utensils and tools, it is good economy to buy the best that can be afforded. Good utensils not only last longer, but also they are more satisfactory while being used.

XVII

THE LAUNDRY: THE MAKING AND USE OF REAGENTS

A REAGENT is any substance that by contact makes either a chemical or a physical change on another substance. For example, water is a reagent; it dissolves and carries away dirt. Soap is a reagent; it forms an emulsion with dirt.

When we starch clothes we have a physical reaction; when we bleach clothes by air and sunshine we have a chemical reaction.

A bountiful supply of reagents in the laundry or in the chemical laboratory is of little use unless they can be used with intelligence. As a chemist knows the peculiarities of the substance with which he is experimenting, just so should the laundress know the properties, both good and bad, of the substance with which she is dealing. Intelligence in the use of reagents must include a knowledge of what results it may accomplish, the proportions in which it is used, the best temperature, whether or no it is applicable to all materials, and what precautions must be taken.

The most necessary, and, fortunately, at the same time the commonest, reagents are water and soap. A large supply of water is absolutely essential for successful laundry work. Water is the natural solvent for much of the soil we find on clothing, and also it acts as a carrier to free the clothes from much insoluble as well as soluble dirt.

Unfortunately, however, the very fact that water is such a splendid solvent renders it in some cases poor water for laundering and cleaning. Why? Because water on its way to us may pass through soil and rock which contain soluble substances of an undesirable nature. The water may become hard from the addition of lime salts. It may be temporarily or permanently hard. Temporary hardness is due to carbonate of lime and permanent hardness is due to sulphates and chlorides of lime. The addition of these salts may not make it harmful for drinking, but they do make it undesirable for laundry purposes, as it prevents the making of a suds.

Another substance which may make water undesirable for laundry purposes is iron. Iron in even small amounts may give the clothes a most undesirable yellowish tinge. The reason for this yellow color is that very minute particles of iron rust are deposited all over the material.

Water for successful laundry work should be clean, soft, and free from discoloration, organic matter, and odors.

If we cannot procure water that fulfils these

requirements by simply turning the faucet, how shall we obtain it? How shall we know hard water and then how shall we make it suitable for laundry purposes? As has been said before, the hardness in water is due to the presence of lime salts. When soap is put into hard water the lime salts decompose the soap and there is formed what is commonly called "lime soap," which appears as a scum on the sides of the tub, on the surface of the water, or on the clothes. Just as long as the lime remains in the water, just so long shall we have lime soap formed, and, moreover, we shall get no cleansing effect from the soap until every single bit of the lime has united with the soap to form lime soap. This curd or lime soap is very hard, if not impossible, to remove from materials, so it must become the business of the housekeeper who has only hard water at her command either to get rid of the lime entirely or at least to reduce its ill effects.

Temporary hardness, which is due to carbonates of lime, may be removed by boiling or by the addition of alkalies, such as washing-soda, lye, borax, or ammonia. When water is softened by boiling, the lime salts are precipitated and settle at the bottom of the receptacle. The softened water can then be taken from the top. Most of us are familiar with the white curd which is often found in teakettles. This is the lime that has been precipitated from the water, and this same thing we do intentionally when we soften

water by boiling. Permanent hardness, due to sulphates and chlorides of lime, is unaffected by boiling, but it can be removed by the addition of alkalies.

In adding alkalies they should first be dissolved in water and added to the washing-water before the clothes are placed in it. Water may be softened in several ways: (1) by the addition to each gallon of water of two tablespoonfuls of a solution made by dissolving one pound of washing-soda in one quart of boiling water; (2) by adding to each gallon of water one teaspoonful of lye dissolved in one cup of water; (3) by allowing for each gallon of water one tablespoonful of borax dissolved in one cup of water. For ordinary hardness these amounts are sufficient, but if the water is very hard the amount may be increased. In softening water there must be added enough of the softening agent to precipitate the lime, but with care not to add so much that there is an excess, which would be deleterious to the fabrics.

The only way to get rid of iron in water is by the use of washing-soda. The washing-soda must be added four or five days before the water is to be used, and allowed to stand until used. The top water is then drained off.

Organic matter may be precipitated by the use of a mixture of borax and alum in the proportion of two parts of borax to one part of alum. This mixture is then added to the water in the proportion of one tablespoonful to a gallon. Where

water is extremely scarce alum is sometimes used to precipitate the dirt from it so that the water can be used again. This should be done only where shortage of water makes it absolutely necessary.

Soaps.—Formerly soap was produced in the home, but now that is one of the many industries which have been taken almost entirely out of the home, so that we rarely find people at the present time who make their own soaps. Soap is made from combining fat with lye. These must be used in definite proportions so that there will not be an excess of either. Excess of fat causes a greasy soap; excess of lye causes a caustic soap. The poor quality of the usual home-made product results from the fact that it is not often possible to tell the exact nature of the fat, and then it is impossible to know the correct proportion of alkali to put with it.

In general, soaps may be classified as mild, medium, and strong. The mild soaps contain no free alkali. The medium and strong soaps contain free alkali, the latter more than the former. Medium and strong soaps should be avoided in laundering fine fabrics, delicate colors, silks, and wools. For ordinary white linen and cotton materials mild and strong soaps are good and they are also desirable where water is hard. Free alkali may be detected in soap by placing a small amount in the mouth. If alkali is present it will nip the tongue.

Soaps very often have something added to increase the cleansing powers, and thus we have borax and naphtha soaps. Borax soaps have borax added to them and naphtha soaps have some petroleum product in them. Naphtha soaps should be used with cold water, as hot water may cause the petroleum product to vaporize, and thus the cleansing effect of it is lost.

Soaps may also contain resin. It is hard to say when resin ceases to be a favorable addition and becomes an adulterant. In small quantities resin is valuable, as it whitens the clothes and helps in making a suds, but when it is used in such large quantities that it gives a dark-brown color to the soap, it can be considered an adulterant.

Soaps may also contain an excessive amount of water or some insoluble substances which simply increase the weight and bulk. Soaps that float have been kneaded so as to incorporate air. Usually they are made of good material and are good soaps, but the floating adds nothing to their cleansing properties. The same amount of material in a much smaller cake would do as much cleaning.

Why do we use soap? Rubbing and water alone will loosen and remove most dirt, but the removal of dirt is accomplished more quickly by the use of soap. The soap-suds penetrate the fiber more completely than does water alone. It softens the dirt and emulsifies the fat, breaking it up into very small particles which can be flushed out of

the material. When soap containing free alkali is used the alkali reacts with any fat which may be present in the fabric, thus forming a soap which is soluble in water. Aside from facilitating the removal of dirt, soap has antiseptic properties. Although it is not an efficient disinfectant in cases of contagious diseases, it is nevertheless valuable as a purifier for ordinary household washings.

Soaps may be used either directly upon the fabric or in the form of a soap jelly. Soap directly on the fabric removes dirt more quickly than jelly simply because it is applied in such a concentrated form, but for fine fabrics, silks, and wools a soap jelly is the more desirable to use.

How shall we choose soaps? In general it is a good plan to use soaps manufactured by a reliable concern. It is poor economy to use cheap, poorly made soaps. Moreover, we must not make the mistake of believing that one soap will do for all purposes. A laundry should be equipped with at least two kinds of soap—a mild soap for materials which even a small amount of alkali might injure, and a medium soap for more durable fabrics. It is well to add a third, a strong soap for all white goods.

It is more economical to buy soap in large quantities so that during storage it may dry out and harden. It should be kept uncovered so that there will be no covering to interfere with the drying effect of the air. Dried soap does not become soft in water as readily, and therefore does not

wash away so quickly. Laundry soap, if exposed to air for some time, may lose as much as twenty-five per cent. of water. In storing it the arrangement should be such that the oldest soap is used first.

Soap formula.—

1 pound of lye dissolved in 3 pints of cold water
5 pounds of fat clarified and melted

When the lye mixture has cooled add it to the fat and stir until as thick as honey. Pour into wooden or pasteboard boxes lined with waxed paper, and set away to harden.

Either two tablespoonfuls of borax or one-half cup of ammonia, or both, may be added to the fat before adding the lye. These simply increase the cleansing powers.

Soap jelly.—

1 large bar of soap
3 quarts of boiling water

Cut soap finely, add to the boiling water, and keep hot until soap is all dissolved; cool and use.

One-half pound of prepared soap chips may be used in place of one bar of soap.

Air and sunshine.—Air and sunshine are reagents in the strongest sense of the word, although it is not always possible to make people believe it. How long will clothes dried indoors keep snowy white? Commercial laundries, where out-of-door drying is an impossibility, treat clothes

with chemicals to retain their original whiteness. We do not question the fact that the chemicals which produce this whiteness are reagents, then why should any one ever question the fact that air and sunshine are reagents? They are most important reagents and bring about most pleasing results. Any housewife who has ever lived in a city where out-of-door drying was an impossibility remembers the joy that she experienced when she again could have her clothes dried out of doors.

Bluings.—Bluing is not an essential for laundry work in the same sense as soap and water. Soap and water are necessities in order to have clothes really clean and sanitary. Bluing may be necessary to make them attractive, but when clothes can be dried out of doors in the air and sunshine they may often be kept white without this addition. Bluing is used to counteract the yellow color which may be caused by something in the water or because of poor drying facilities. Bluing should not, however, be used to counteract the effects of careless washing.

Why does bluing make clothes appear white? One explanation often given is that yellow and blue, being complementary colors, when used together give the effect of whiteness. Another explanation, and one which is perhaps truer, is that the slight bluish tinge makes for what most of us call whiteness. Bluing is obtained from different sources:

1. *Indigo.*—Indigo was originally of plant

origin, but is now manufactured artificially (synthetic indigo). Formerly it was the chief ingredient of bluing compounds, but now it is very little used in the laundry.

2. *Prussian blue.*—This gives a better color than indigo and is also easier to use. It has one great drawback, however: it is an iron compound and is decomposed by alkalies, so that iron-rust results. If all soap or any other alkali is not thoroughly rinsed from a material before putting into bluing made with Prussian blue we may have quite a disastrous result, for the bluing may unite with all the soap and alkali particles, and the article become mottled with iron-rust spots. However, if clothes are carefully rinsed, Prussian blue is a very satisfactory bluing. As Prussian blue is one of the most common liquid bluings in the market, it behooves us to practise careful rinsing.

3. *Ultramarine.*—Ultramarine was originally obtained from finely ground lapis lazuli, but now it is manufactured artificially. It comes in the form of small cubes or balls. The better the grade of ultramarine, the more finely it is ground. As the efficiency of the bluing depends upon the suspension of these small particles in water, it is necessary, for satisfactory results, to have the powder very finely ground so that it will be evenly suspended in water.

4. *Aniline blue.*—Aniline blue is a coal-tar product and its action is really that of dyeing the

material. The material is simply dyed a very, very light blue. Aniline blue is used in commercial laundries extensively, but not in the home laundry. It will not set in an alkaline solution, and it requires an acid to bring out its color. This bluing is also difficult to wash out of materials.

Bluings which come in solid form should be used by wrapping in flannel or several thicknesses of other kinds of material, and then stirring about in a bowl of water. In this way only the finest of the powder is obtained. Enough of this blued water is then poured into the tub of water to get the desired shade. This tub of water should, however, be stirred before placing clothes in it, as otherwise there will be streaks caused by the clothes striking the particles of bluing which have settled.

In using liquid bluings it is safer to make a strong solution in a bowl first and then add enough of this to the tub to get the desired shade. The tub of water is more evenly blued in this way than by putting the bluing in direct. The bluing-water should be only a light blue; more than that should never be necessary.

There is a great variety of bluings on the market from which to choose. Each housewife must experiment to find out which is most satisfactory, and then she should learn to use that particular brand properly.

Starch.—Starch, like bluing, is not an absolute essential in laundry work. One of the main

reasons for its use is to improve the appearance of the clothes. Another reason for its use is that the glazed surface of starched materials keeps clean longer than the rougher surface of most unstarched materials. In general, the American housekeeper of to-day uses corn starch; in fact, at many retail grocers, it is not always possible to obtain any laundry starch except corn starch. Commercial laundries, however, make use of rice, corn, and wheat starches, according to the fabric and also the desired finish.

Corn starch is used because of its cheapness and also because of the general lack of knowledge of the advantages of the different kinds. The reason for the use of various starches in laundries is because of the differences in their penetrability and also because of pliability and finish given to the articles. Rice starch gives a natural pure-white color, corn starch a yellow color, and wheat starch a tint in between. As to penetrability, rice starch has the greatest, corn starch the poorest, and wheat starch stands in between. Rice starch is not much used in this country and is not manufactured here.

To compare the starches which are commonly used, wheat starch gives a good color, a smooth surface, and a pliable and fine finish, and it is also considered to offer better resistance to dampness. Corn starch gives a greater stiffness to the fabric, but when pliability as well as stiffness is desired, wheat starch gives better results.

Starch is in the form of very small granules which are present in many plants. These granules will not dissolve in water. The starch powders which we see are masses of starch granules. When water is added to starch and the mixture is heated, the heat causes the moisture to penetrate the granules, and finally these swell and burst, resulting in jelly-like starch paste. Starch should be cooked long enough so that there is no possibility of any of the granules being left unbroken. In case all the granules are not broken in cooking, they will in all probability be broken by the heat of the iron. Then the starch will stick to the iron, and also we may have the appearance of the material marred because of the scales which the starch may form. Starch in cooking may become slightly yellowed because of the caramelizing of part of it, and for this reason bluing is often added to it. Bluing must be added to starch in diluted form, or there will be streaks in the starch, as the starch is so thick that it does not mix freely.

Different substances may be added to starch to improve it. The most common additions are borax and fats. Borax is beneficial in that it increases the whiteness of the starch, adds gloss, and increases the stiffness. Oily substances, such as wax, paraffin, lard, and cottonseed-oil, are used to give smoothness and finish, and to prevent the iron from sticking.

Cold starch is used for great stiffness, and also

for saving of time, but in order to get beautiful results experience is necessary. As the starch granules have not been cooked beforehand, they are cooked by the heat of the iron and then they have a great tendency to stick to the iron and to cause scales on the material.

There are prepared starches on the market which can be used for general laundry purposes that require no cooking and are used cold. These starches are most satisfactory if used according to directions. In their use the article is dipped into the starch, wrung very dry, rolled in a cloth for a stated length of time, and then ironed. Unless the material is dried before starching it does not get the benefit of the bleaching effects of the sun and air. These prepared starches are especially good for emergencies and in any case where quick results are a necessity. If used carefully the material irons easily and has both a smooth and flexible finish.

Starch accomplishes stiffening by coating the thread and filling the pores of the cloth.

STARCH RECIPES

Cold starch.—

2 tablespoonfuls of laundry starch
½ teaspoonful of borax dissolved in ¼ cup of boiling water
1¾ cups of cold water

Add the cold water gradually to the starch,

mix well and smoothly, then add the hot borax solution. Stir before using.

Thick starch.—

¼ cup of starch mixed with ½ cup of cold water
1 teaspoonful of fat
½ teaspoonful of borax
1 quart of boiling water

To the starch and water mixture add the borax, fat, and then the boiling water, slowly. Cook, stirring constantly, for twenty minutes. Strain and use hot. For medium starch use three tablespoonfuls of starch, and for thin starch use two tablespoonfuls of starch. For starch jelly use one-half cup of starch. Starch jelly must be cooked in double boiler, as it is so thick that it would burn most readily if placed directly over the flame.

Materials should be dipped into the starch while hot, and after wringing it is well to rub the materials between the hands so as to help rub in the starch. Starch jelly, however, is always rubbed into the material, as is described on page 164.

Washing-soda.—Washing-soda is useful in the laundry for softening water and also in washing very greasy clothes. The soda reacts with the grease to form a soapy mass which can then be more easily rubbed and flushed out of the material than can grease alone. However, washing-soda must not be used on colored materials, and it

must be thoroughly rinsed out of white fabrics, as it eats the fiber if left in.

Washing-soda should be used in solution and it should be added to water before any clothes. Washing-soda is much maligned mainly because it is carelessly and improperly used. It is a very strong reagent and must therefore be used with care.

Washing-powders in general owe their efficiency to washing-soda. Some of them are made entirely of washing-soda, others contain some soap, and a few borax, but in all cases washing-soda forms a very great part of the powder. Many of the manufacturers of these powders recommend that the powder be dissolved in water before adding to the wash-water. The object is to guard themselves against the harm which results from the direct contact of fabric and washing-soda. The difference in the cost of washing-soda and washing-powders must be noted. Washing-soda can usually be had for three or four cents a pound, whereas washing-powders cost two, three, four, or five times as much, according to the brand.

Ammonia.—Ammonia-water is a valuable addition to a laundry. It is made by dissolving ammonia-gas in water. Household ammonia is an extravagance. It is far better to buy concentrated ammonia from the druggist and then dilute with six times as much water to obtain a known strength with which to deal.

It has been estimated that in purchasing house-

hold ammonia one pays from two to five dollars per pound for ammonia-gas, according to the brand. The price of concentrated ammonia runs from seventy-five cents to one dollar per pound for ammonia-gas. The saving in buying concentrated ammonia is evident, as one must judge any ammonia by the amount of ammonia-gas it contains. The retail price of concentrated ammonia is between forty and fifty cents per quart. For ordinary strength add six parts of water to one of ammonia.

Like washing-soda, ammonia is an alkali, but it has the advantage of being volatile, so that there is not the danger of its remaining in the materials and eating the fibers. Also it is not so hard on the hands, its action being more gentle. It is used to soften water and as an aid in removing dirt.

Borax.—Borax is useful in softening water, removing dirt, whitening clothes, as a stiffening agent, and in the removal of stains. It is a splendid cleansing agent, as it is not harmful to materials, colors, or the hands.

Javelle water.—Javelle water is a great help in removing stains. It is a strong reagent and must be used with great care. After its use, in no matter what strength, the material should be thoroughly rinsed in ammonia water and clear water. If Javelle water remains in the fabric the material will be injured.

For removing stains a solution is made of equal

quantities of Javelle and boiling water. The stain is then immersed in this.

For general bleaching it is used in the proportion of one part Javelle water to thirty-two parts of cold water. The articles are put into this solution, brought to the boiling-point, allowed to stand about five minutes, and then rinsed. This is used for general bleaching and often also for removing all the color from faded materials. Too much precaution cannot be taken in the rinsing.

Javelle water.—

1 pound of washing-soda dissolved in 1 quart of boiling water

½ pound of chloride of lime dissolved in 2 quarts of cold water

Pour the clear liquid from the chloride of lime solution into the dissolved soda. Let the mixture settle and then pour the clear liquid into bottles; cork, and keep in a dark place.

Gum arabic.—Gum arabic solution is often used in place of starch for stiffening materials where the white color of the starch would be objectionable. It may be used for fine organdies, laces, and silks. It is also used on dark-colored materials, so as to avoid the danger of whiteness of the starch marring the appearance of the dark material. A solution of gum arabic can be made and then used in water according to the material and the stiffness desired. Simply to give body to materials, as in the case of silks and laces, a solution used in the

proportion of one-quarter of a cup of gum arabic solution to one quart of water is satisfactory.

Gum arabic solution.—

1 ounce of gum arabic
1 cup of boiling water

Pour the boiling water over the gum arabic, and keep over hot water until all dissolved. When cool, strain through a cheese-cloth, pour into a bottle, cork, and keep for future use. Sometimes one tablespoonful of alcohol is added to the solution when it is to be kept a very long time.

Wax.—Wax is essential for rubbing on irons so that they may be kept in good condition. It may be bought especially for irons. If it is not purchased in special form, either beeswax or paraffin wax may be used. It should be tied in a cloth before applying to the iron.

Oxalic acid.—Oxalic acid is of great assistance in removing iron rust, some ink, and some fruit stains. When used hot it acts more readily than in a cold solution. The application of oxalic acid should be followed by an application of ammonia water and thorough rinsing. Oxalic acid is poisonous and must be used with care. It is purchased in crystalline form. Used in the proportion of one teaspoonful of crystals to one cup of boiling water it is effective for many stains, although the strength may need to be increased if stains are obstinate.

Tartaric acid.—Tartaric acid is used in the same proportions as oxalic acid and is beneficial in removing iron rust stains. It is also purchased in crystalline form.

Hydrochloric acid.—Hydrochloric acid is very strong and eats the fabric unless used with extreme caution. It is also a poison. Perhaps the safest way of using it is to place the stained portion of the article over a bowl of hot water containing borax in the proportion of one teaspoonful to each quart of water. The acid should then be applied drop by drop until the stain changes color, and then dipped immediately into the water. If the stain has not disappeared, the treatment should be repeated until it does disappear. A medicine-dropper is an easy way to drop the acid. After the spot is obliterated the article should be thoroughly rinsed in ammonia or borax water and then in clear water. Hydrochloric acid is excellent for removing iron rust and ink stains.

Solvents.—Naphtha, benzine, gasoline, ether and chloroform, all of which are extremely volatile, are useful for removing oils and grease. These must be used with extreme care; they should be used out of doors or by an open window. They should never be used where there is a flame of any kind. The vapors of these are all heavier than air, and therefore sink, so that if they are used in the home there should be a current of air near the floor to insure their quick removal.

Kerosene, turpentine, carbon tetrachloride, and

alcohol are also good solvents and not so volatile. None of them should be used near a flame.

Fullers' earth and French chalk.—These are used to absorb dirt and grease. The material, or the portion to be cleaned, is covered with the powder and allowed to stand several hours until the dirt is removed. The powder is then shaken or brushed from the material. If not cleaned, apply the same treatment again.

Salt.—Salt is a good frictional agent for the cleaning of irons. It is also beneficial in the removal of some stains and in the setting of colors.

Alum.—Alum is useful for clearing water, for setting colors, and it is also used for rendering clothes non-inflammable. For this last purpose two ounces of alum are dissolved in one gallon of water and the articles are rinsed in it. Curtains and children's dresses are sometimes submitted to this treatment.

Plenty of soft water and good soap are absolutely essential for successful laundry work at all times. Air and sunshine are also very valuable, but where they cannot be had there are chemicals which will in part take their place. Other reagents should need to be used only occasionally, and then they must be used with intelligence or the last state of the textile may be far worse than the first.

For the usual amounts of reagents to be kept on hand for household use see Chapter XXVI.

XVIII

THE LAUNDRY: REMOVAL OF STAINS

THE difficulties that attend the removal of stains are well shown by the statement which many laundries and cleaning-establishments print quite conspicuously on their laundry slips: "Stains removed at the owner's risk." It is often possible to remove the original spot or stain, but sometimes we have a result which adds no more beauty to the article than did the first spot. Far too frequently stains are removed at the expense of the color, the material, or both. The substance that removes a stain is called a reagent. In choosing a reagent one must consider the kind of material and the color as well as the stain itself.

All stains are more easily removed when fresh. If allowed to stand, the composition, when exposed to air and moisture, may change, and also the spot gains a better hold in the material. Just as butter decomposes when kept for too long a time, so will grease and many other kinds of

stains change when left on material. Dust may also gather on the spot. Between decomposition and dust there is every possibility for us to get a more complicated substance with which to deal.

To take out any stains the simplest means should be tried first, but if the stain resists, a more severe method must be used. When a stain is of long standing and very obstinate it is usually necessary to resort to a means which may weaken the fiber.

Practically all stains are more easily removed if first soaked in cold water, and many stains which become obstinate when old are entirely removed while fresh by this same soaking in cold water. Boiling water poured through many stains which have already been soaked in cold water will obliterate them entirely. The boiling water is more effective if poured from a height so that the stream will strike the spot with force. If the material is stretched over a bowl this is easily accomplished. The stream from the spout of a teakettle is excellent. If either of these methods will remove a stain from white goods we may be sure that the material is not harmed, but on colored articles there is some possibility of injury to the color, especially if a delicate one.

Sometimes if a stain resists both cold and boiling water it will yield to sunshine. The article must be kept wet all the time it is in the sun in order to have the treatment effective. This is the way our grandmothers bleached their fabrics. In

winter stains can be removed and materials bleached by allowing the article to freeze. The stain yields because the water is retained in the goods for a long time. The removal of stains by means of sunshine and freezing is applicable only to white cotton and linen materials. Either method affects colors and also silk and wool fibers.

It cannot be too much emphasized that stains should be removed at the earliest opportunity after the mishap, and, if possible, before wash-day, so that the housewife may not begrudge them the necessary time. In all cases they must be removed before they are put in soapy water, which has a tendency to set stains. If it is necessary to resort to other means, such as the use of an alkali or acid, it must not be forgotten that the action of the reagent itself must be counteracted. This means that the application of an acid must be followed by that of an alkali, and *vice versa*. Most of us are familiar with cases where a stain has been removed and later a hole has appeared. This was the result of the reagent working in the material after it had eradicated the stain, when, if it had itself in turn been eradicated, the texture of the material would have been unharmed.

In removing a stain from colored materials there is only one safe thing to do—that is, to try the reagent, whether it be boiling water or something more severe in its action, on a piece of the

material first. Whether or no the color is harmed by the treatment depends entirely upon the dye used in the fabric. For instance, two pieces of blue cotton may appear alike, but unless they have been dyed in the same dye they will not react in the same way. The color in one might be destroyed by the application of boiling water, whereas the other might withstand the action of boiling water and also a weak acid, such as oxalic acid.

Age stains, such as one finds on linen, can be removed by bleaching in the sun.

Blood.—Cold water should be used first on blood stains. The article can then be washed in soapy water. Where water cannot be used the best thing to use is a paste made of raw starch. This paste is put on the spot and left until dry. If the stain does not disappear the paste should be applied again and again in the same way until the spot is entirely obliterated. This treatment will not injure the finest materials.

Brass.—Brass stains, such as appear when cloth, brass, and moisture are left together for a considerable length of time, should be first treated with grease so as to soften the material and then washed with soap and water.

Chocolate.—See Cocoa.

Cocoa.—Cocoa and chocolate stains if neglected are especially hard to remove, and often, if of very long standing, they cannot be eradicated without destroying the material. In any case

they should be sprinkled with borax before being placed in cold water and then, after soaking, boiling water should be poured through them.

Coffee.—Borax sprinkled on tea and coffee stains before placing in cold water usually hastens the removal of the stain. These stains very often yield to boiling water. If the tea stain is old, soaking in glycerine for a short time will often aid in its removal. Coffee and tea stains are often very obstinate, and then they must be bleached; natural bleaching by the sun or Javelle water (see page 168) may be used.

Cream.—Milk, cream, and meat juice (which always has combined with it more or less grease) are removed by soaking in cold water and then washing in soapy water. These spots usually disappear with this treatment. If they do not yield, they can be bleached.

Colored inks.—Alcohol is usually sufficient to remove stains of colored inks. They also yield to ammonia solution. Alcohol may be used on colored goods, but ammonia should not be so used.

Fruit.—Fruit stains are doubtless the most common of all stains on table-linen and very difficult to remove if neglected. Almost all fruit-juices contain sugar and pectose, a sticky and gumlike substance. Because of these constituents, boiling water poured on fresh fruit stains removes them, as it dissolves the sugar and the pectose, just as we all know it would dissolve a jelly, which is a combination of fruit-juice and

sugar. If, however, the stain is allowed to stand in the material the process of removing is not so simple. It may need to be bleached by sun or frost, or even by oxalic acid or Javelle water. The oxalic acid and Javelle water should be used according to the directions given in Chapter XVII, and the article must invariably be rinsed in ammonia water and then in clear water.

The most difficult fruit stain with which one has to deal is peach stain. It very seldom, even when fresh, yields to boiling water. Sometimes it will yield to Javelle water or oxalic acid, and sometimes it can be removed by bleaching in the sun or freezing.

Grass.—If grass stains are new, washing in naphtha soap and cold water is usually sufficient. This is the best method if the whole article is to be washed, as in the case of children's clothes. Ammonia and water, if used immediately, removes these stains, and so does alcohol. In cases where alcohol or ammonia may affect the colors, molasses or a paste of white soap and cooking-soda may be placed on the stain and left until the stain turns color. Then it can be washed out.

Grease.—When an article is washable, grease can usually be taken out with warm water and soap, but if that is not possible, ether or gasoline will dissolve it. Vaseline also yields to these solvents (ether or gasoline), but it is important to remember that vaseline *cannot be removed* after it has been washed in. See also Pitch.

Indelible inks.—Many indelible inks have as their main constituent silver nitrate, and to remove this the best thing is potassium cyanide, a deadly poison. It is usually used in a ten per cent. solution, and must, of course, be thoroughly washed out. In using it the hands must not come in contact with it if there are any cuts on them. It is best applied with a brush. Many indelible inks at the present time are made of aniline dyes. These cannot be removed without injuring the material.

Ink.—Sometimes we know how and where we get stains, but more often we know nothing about them until we see them. Perhaps the most common stain and at the same time one of the most difficult that we have to deal with is ink. If it were possible for us to know the composition of the particular ink which has caused the damage it would then be a comparatively simple matter to remove the spot. At the present time, when every manufacturer makes his ink from his own formula, and one different from all other formulæ, is it any wonder that it is impossible to find one remedy for all ink spots? In the first place, cold water should be applied, and often it will wash out a fresh ink stain. Here, as in the treatment of all other stains, gentle means should be used first. If cold water, the gentlest of all, is ineffective, then lemon-juice and salt or milk is the next to try. In using lemon-juice and salt the stain is covered with a paste made of the two

and placed in the sunshine. If the stain is not removed before it has dried, more lemon-juice should be added. The stain must be kept moistened in order to have the reagent effective. If it is impossible to place the stain in the sunshine, holding over steam is a fairly good substitute and hastens the action. If milk is used, the stain is placed in the milk, and as the milk becomes discolored it is changed. Then the stain is allowed to stay in the milk until it disappears, and this usually occurs after the milk has soured.

Salts of lemon is often used on ink stains. This must not be confused with lemon-juice and salt. Salts of lemon is chemically potassium binoxalate, and it is a poisonous compound which comes in the form of crystals. To apply, it is moistened and placed on the stain, and again sun helps the action. Oxalic acid and tartaric acid can also be used according to the directions in Chapter XVII. We must remember that these are acids, and therefore they must be followed by an alkali, such as ammonia or borax. Another acid which many times removes stains when these other means have failed is hydrochloric acid. This is a stronger acid, and therefore it must be used with more care. Hydrochloric acid is stronger than oxalic and tartaric acids, and unless the action is stopped immediately by an alkali the fabric will be destroyed. Javelle water is also beneficial in removing ink stains. It is applied in the same way as for all stains. (See page 168.)

Sometimes the Javelle water does not remove the stain, but simply turns it brown. This brown stain can usually be removed with oxalic acid. Since in removing ink stains the process depends upon the composition of the ink, and since that is not known, one must simply try reagents until one is found that acts most readily. If the family uses the same kind of ink always, it is easy to continue to use the reagent that has been found satisfactory. There are many ink eradicators on the market. In most cases these come in two parts; the first applied bleaches the material, and the second stops the action. There are two of them for the same reason that we use two reagents, such as oxalic acid followed by ammonia.

Ink on silk and wool.—On silk and wool materials hydrogen peroxide or weak acids are the only things that can be used. Hydrogen peroxide is the best, but the objection to it is its expense. On white fabrics these reagents can all be used, but on colored fabrics many of them remove the color as well as the stain. Milk and the weak acids, oxalic and tartaric, are the safest to use, but even then the color may be weakened. If the color is changed, a weak ammonia solution (see page 167) will often restore it.

Iron rust.—Another common stain is iron rust, which is iron oxide. This does not dissolve in water, but when it is treated with hydrochloric or oxalic acids, either iron chloride or iron oxalate

is formed, and these do dissolve in water. These acids are used in exactly the same way as for ink stains. Lemon-juice and salt can also be used on iron rust stains if not of too long standing. This is applied the same as for ink stains.

Kerosene.—Kerosene on wash goods can be washed out with soap and water, but on materials which cannot be treated with water, the kerosene can be absorbed by Fullers' earth. The stained portion is covered with the Fullers' earth and allowed to stand until the earth absorbs the kerosene.

Machine-oil.— Machine - oil can usually be washed out with neutral soap and cold water. When it has got into the stitching on a dress and it is not advisable to wash it, it can be dissolved out in gasoline or benzine.

Meat-juice.—See Cream.

Medicine.—Medicine stains in most cases yield readily to alcohol. Iodine stains, however, yield more readily to ether or chloroform, although if not badly set they are soluble in alcohol.

Mildew.—Mildew is different from any other stain because it is a mold and, like all plants, it requires warmth and moisture for growth. Like other molds, strong sunlight will kill it, so that if the cloth is dried in strong sunlight the growth is stopped, but the material is not necessarily bleached. The ease with which it can be removed depends upon how long the mold has been growing. Sometimes the spots can be removed if they

are covered with lemon-juice and placed in the direct sunlight. If the stain is covered with a layer of soap jelly mixed with pulverized chalk and exposed to the sunlight it will sometimes disappear. Sometimes, when all the other means have failed, Javelle water will take out the stain, but it is impossible to insure success if the mold has had a chance to grow too long.

The best way is to guard against mildew and not to have it to contend with. When cloth is left moist and warm for a length of time, and especially if it is rolled up tight so that the inside is dark, there is every opportunity for mold to grow. Clothes often mildew if left dampened for a long time in warm weather, and sometimes, if clothes are being bleached and are left on the grass for an extended length of time when it is warm and there is no sunshine, they mildew.

Milk.—See Cream.

Mice.—Mouse stains are often found on clothes kept in drawers in empty houses. They are best removed by bleaching in the sun.

Paint.—Paint spots can be removed by turpentine, benzine, naphtha, or chloroform. The last two are especially good for colored and delicate fabrics. Any of these reagents dissolve out the oil which holds the other ingredients of the paint in solution, and then the insoluble portion can be brushed off. If the spot is old it should be softened with grease—cottonseed-oil and lard are both good—before applying the solvent. On non-

washable goods the solvent should be most carefully used, and to prevent spreading it should always be rubbed toward the center of the spot as much as possible. It is also a help to surround the spot with a powder, such as French chalk or starch, to absorb the surplus liquid. Turpentine, unless pure, may leave a resinous residue, but this can be dissolved in alcohol.

Paint may be easily removed from woolen material if it is dealt with immediately, while the paint is still wet, by rubbing the part touched by the paint with another and clean part of the material. The paint, being wet, is easily disintegrated and absorbed. White paint on black wool will disappear entirely by this process, but it is well to have the article cleaned immediately in gasoline. This is not because there is any danger of the reappearance of the paint, but for cleanliness.

It must always be remembered that the greatest care must be taken in using benzine, gasoline, naphtha, and chloroform, as they are highly inflammable. Varnish stains are treated in the same way as paint, except that they cannot be removed by rubbing with the material.

Perspiration.—Stains from perspiration are removed by moistening with water and placing in sunshine, or, if badly discolored, as around the tops of collars, the article is bleached more readily if it is dipped in soap solution before placing in the sunshine. Very badly stained collars will yield to

this treatment and it will not injure the material. If this method cannot be used, resort can be had to Javelle water. The article will be bleached without a doubt, but the process is much harder on the material.

Pitch.—Pitch, tar, and wagon-grease need to be softened with grease and then they can be removed with turpentine. Sometimes washing in soap and water after the application of grease is sufficient.

Scorch.—If the scorch is only on the surface and the material is not injured it can be bleached out. The best way to do this is to moisten it and place it in the sunshine. Where no sunshine is obtainable a bleaching agent, such as Javelle water, will take out the scorch.

Tar.—See Pitch.

Tea.—See Coffee.

Wagon-grease.—See Pitch.

Wax.—As much wax as possible should be scraped off, but it should not be scraped so close to the material that the threads are roughened. Most, if not all, of the remaining wax may be removed by placing a piece of blotting-paper under the spot and another over it, and then applying a hot iron. The heat melts the wax and the blotting-paper absorbs it. If it is not entirely removed the rest may be dissolved in gasoline or benzine. If there is color left, as in the case of drippings from colored candles, it can be removed with alcohol.

Wine stains.—If possible, salt should be placed at once on fresh wine stains. This helps to absorb it. If the wine has dried on a white material, soaking in cold water and pouring boiling water through it will usually take out the stain. If, however, it should resist this treatment, Javelle water can be used according to directions on page 168. This will usually bleach it, but the boiling water ought to take it out unless the spot has been badly neglected.

General considerations.—To remove a stain intelligently one must first consider the kind of material, whether or no it has color, and the probable composition of the stain. All three points are important, and the problem is to choose the reagent which will not only remove the stain, but at the same time leave the material in as nearly good condition as possible. It is often fatal to be ready to say "I can't make it any worse, so I'll try this." The first requisite is to exercise some intelligence. To take an ink stain out of a blue dress at the expense of the color, leaving a white spot, is not removing a stain. Is not the white spot as ugly as the black spot? The removal of spots and stains does require time and thought, but there is a good deal of satisfaction in removing an obstinate spot without ruining the material. This can usually be accomplished with a little forethought.

XIX

THE LAUNDRY: WHITE MATERIALS

AN understanding of the structure of the different fibers is a help in doing laundry work in general. Cotton and linen fibers both consist for the most part of cellulose, and for this reason they respond in the same way to cleansing agents and chemicals. The cotton fiber is a long, flattened, twisted tube which is slightly thicker at the edges than in the center. The tubular formation and also its twist give it a certain lightness and elasticity. The linen fiber is a long transparent tube with smooth walls which are indented at intervals. An examination of these under a microscope is most interesting.

Strong mineral acids have a solvent action on cotton and linen fibers if allowed to remain for any length. If allowed to stay in the material long enough they will dissolve the material entirely. Weak mineral acids have only a slight effect on the fibers, provided they are thoroughly washed out with water and then rinsed in ammonia to

counteract the action. If the acid is allowed to remain in the fabric its effect may not be seen immediately, but, nevertheless, the durability of the material may be affected.

Hydrochloric acid, often called muriatic acid, is the most common mineral acid used in the household. Every housekeeper must use it with care, as noted in Chapter XVII. Organic acids, such as acetic, tartaric, oxalic, and citric, have little or no action on the cotton and linen fibers unless allowed to dry on and then are later moistened and ironed. If this is done, then we get into difficulties. If used with sufficient precaution, both mineral and organic acids may be used when necessary to remove stains from white cotton and linen materials.

Weak solutions of washing-soda, borax, and strong soap have little or no harmful effect on cotton and linen fabrics, provided the fabrics are not left in the solution a long time. Strong alkaline solutions, for a very short time, do not injure cotton and linen fabrics, but beyond a very brief space of time their action is deleterious. Because neither cotton nor linen fabrics are injured by a limited use of acids and alkalies, and because there is no color to consider in white goods, stains can be removed with considerable ease.

If possible, we should soak all white materials, but if that is not possible, at least the most soiled ones should be soaked. They should then be washed in as many soapy waters as necessary,

boiled, rinsed, blued, and starched. Clothes should be wrung between every two processes.

Table-linen.—Table-linen should not require much rubbing, as it is seldom very dirty. One of the places to look for soil on table-cloths, however, is on the part which touches the edge of the table. What we should look for on table-linen of all kinds are stains. These must be taken out before placing in soapy water. Sometimes, if table-linen is in a bad condition from careless washing, boiling in Javelle water according to directions on page 168 bleaches the whole article and improves the appearance considerably.

In wringing table-linen the rollers in the wringer should be loosened, as the material is very soft and creases most easily. The bluing-water should be a very light blue indeed because of the softness of the material. Good table-linen has plenty of body, but sometimes old, thin table-linen is starched very, very slightly, just enough to make it seem firm.

Table-linen should be hung so that the weight and strain come on the warp threads (the "long way" of the cloth), as they are stronger than the woof threads. If we have a care about the stretching and hanging of table-linen, the task of ironing will be greatly lessened.

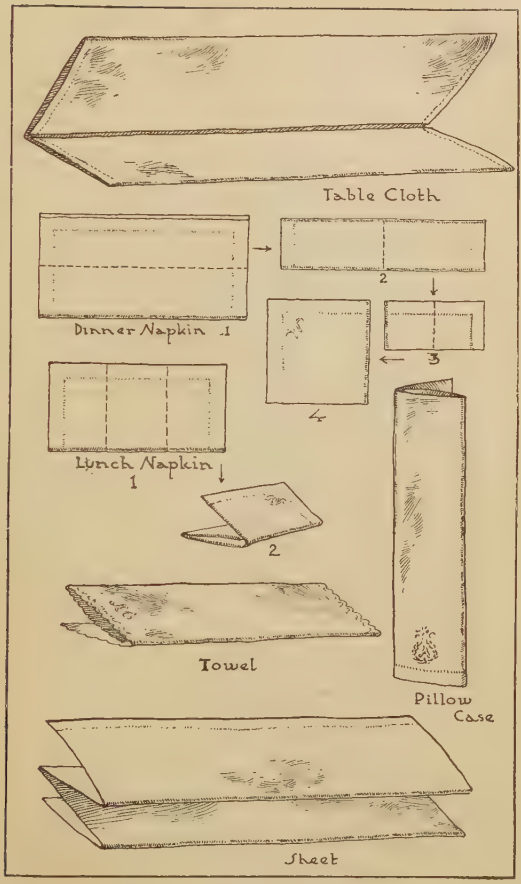
That table-linen must be thoroughly and evenly dampened to look well when ironed is one point on which all laundresses agree. Some laundresses still believe that the beautiful results obtainable

by ironing table-linen just after wringing it from the last rinsing-water are worth the time and strength that it entails. There is no question of the beauty of the result, but let us hope that we all question the wisdom of using our time and strength in this way! Table-linen dampened evenly with a whisk broom, rolled tightly with the hems and selvages turned in, wrapped in a heavy cloth, and allowed to stand several hours, can usually be ironed with most satisfactory results.

Another way which some laundresses use to get even dampening is putting one-half of the dried table-cloth in boiling water, wringing as dry as possible, folding the wet half over the dry half, and rolling tightly. With napkins the same idea is carried out by wringing one-half the number of napkins out of boiling water, then placing the napkins in a pile, alternating the wet and dry ones, and rolling tightly. In any case the aim should be for plenty of dampness evenly distributed.

In ironing table-linen, heavy irons and pressure are necessary for the best results. Ironing a table-cloth on a table is easier than on a board, as it is possible to expose so much more surface at one time, thus doing away with so much moving of the cloth. All table-linen should be ironed partly dry on the wrong side and entirely dry on the right side.

Table-cloths are folded wrong side out, with



FOLDING OF HOUSE-LINEN

selvages together and corners even. They are then ironed on both halves of the wrong side. The more carefully they are pulled into shape the easier the ironing. If they can be stored with just the center crease, they are then ironed on both halves of the right side. If more folds are necessary for storing, the cloth is ironed first on but one-half of the right side, opened out, and the selvage edges folded to within one-half inch of the center crease. The one rough surface thus exposed is then ironed and a crease made on the other side. It is then folded again on the center crease and the last rough surface ironed. In this way the entire cloth is ironed on both the right and wrong sides, and the creases are all uniform. (See diagram.) After ironing, it may be rolled or placed in loose crosswise folds for storing. The fewer creases in a table-cloth, the better.

Napkins should be placed on the board with the selvages parallel to the edge of the board, wrong side up, with the initial in the upper right-hand corner if it is so placed that that is possible. The napkin should be ironed partly dry on the wrong side, then the lower edge should be brought to within half an inch of the upper edge, and this surface ironed. The folded edge is then brought to about a quarter of an inch of upper selvage, and this surface ironed. Now the left-hand edge is folded to about one-half inch of the right-hand edge, ironed, and the folded edge is brought over and made absolutely even with the outer edge.

This is ironed, and then the napkin is turned and ironed on the last surface. By not making the folds quite together, allowance is made for the pushing out of the material by the folding that follows. A well-ironed napkin has good square corners and no projecting edges. Sometimes the crosswise folds are not pressed in at all, as many people think that the surface broken by creases is unattractive. (See diagram.) Small napkins are folded once crosswise by bringing two edges together and then creased twice lengthwise so that the monogram is on top.

Doilies are ironed on the wrong side and then on the right side. They should be stored flat or on a paper roll. The treatment of embroidered doilies is described in Chapter XXI.

Colored table-linens are treated the same as other colored materials in the washing and ironing.

Bed-linen.—Sheets must be washed on both sides, and as they are so cumbersome they must be attacked with system, or some part may escape attention. The end with the wide hem is the most handled and thus usually the most soiled part of the sheet. This end must be well soaped and well rubbed.

The center of the pillow-cases should receive the most attention. They should be turned wrong side out in the process of washing, and left thus until dampened for ironing.

Sheets should be hung like table-cloths, the

"long way" of the cloth. Pillow-cases are hung by the seam opposite the hems. If hung by the hem they are likely to be torn by the force of the wind blowing into them, with no escape at the opposite end, and if hemstitched there is undue strain on the stitching.

The folding of sheets is more easily accomplished by two people. The hems of the sheet are brought together, having the wrong sides out, and pulled until even. The hemmed ends are then folded back on either side to the center crease, so that the right side of the hems are out. Pillow-cases are turned right side out. Sheets and pillow-cases are but slightly dampened, and mostly at the hems.

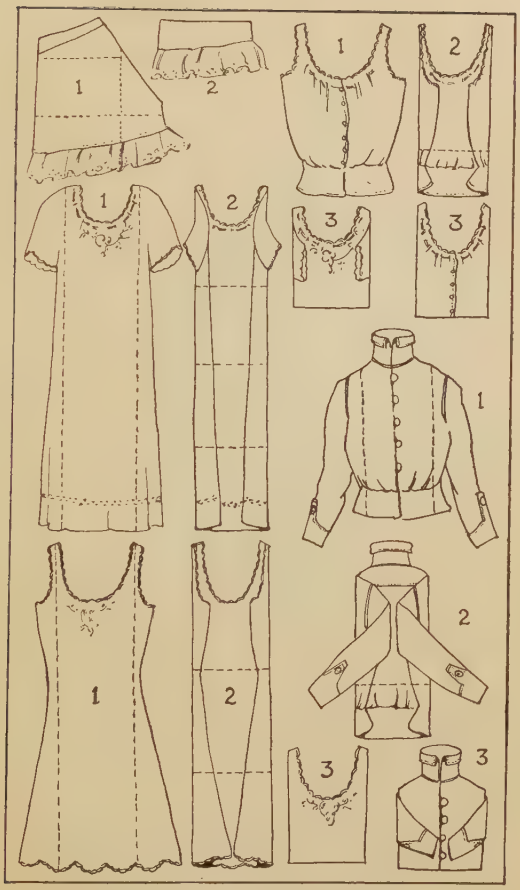
Many people leave sheets unironed because they like the fresh smell of sun-dried material. In ironing sheets, heavy irons and pressure are necessary. They are ironed on the side with the narrow hem, and then on the side with the wide hem. If the irons are hot and the pressure sufficient, the wrinkles are taken out of the center by the ironing of the ends.

The inside of the hems of the pillow-case should be ironed first. Then it should be ironed on one side, and if ironed beginning at the corner where the end and side seams meet, the wrinkles will be ironed away from the seam, where usually they collect. Slightly less than a third of the case should be folded over and ironed, then the other edge should be folded over, the exposed rough

side ironed, and then the whole turned and last rough side ironed.

Body-clothes.—In washing body-linen especial attention must be paid to hems, neck-bands, and armholes. They should be washed on the right side in the first suds, and on the wrong side in the second suds. If only one wash-water is used they should be washed first on the right side, and then on the wrong side. Before putting into the boiler hems and bands should be soaped. In wringing, care must be taken to turn the buttons inside, and also to have them flat, so that they will not be forced off. Materials should be fed to the wringer in even folds, so that the whole garment will be evenly wrung. If a little care is used there is no reason why any article should be mutilated in a wringer.

The amount of the garment to be starched and the thickness of the starch depend greatly on individual taste. The starch for the trimming should be thinner than for the body of the garment. A good proportion for the body of the garments is one and one-half tablespoonfuls of starch to one quart of boiling water; and for trimming, one-half tablespoonful of starch to one quart of boiling water. The thinner starch can be made by diluting the thicker starch. All cooked starch should be used very hot. After wringing garments out of the starch they should be rubbed between the fingers so as to help blend the starch with the fabric.



FOLDING OF BODY-LINEN

In general, the following garments or parts of garments are starched: cuffs and yoke of nightdress, hems and tucks of drawers, entire corset-cover (in thin starch), ruffle of skirt or the lower half, and sometimes the whole skirt (in thin starch), the tops of chemises or sometimes the entire garment (in thin starch), and combination corset-covers and drawers.

Starched clothes should not be hung in the wind if it can be avoided. The wind blows the starch out. All white clothes should be hung in the sun if possible, as this helps to whiten them. All clothes should be hung wrong side out. The following ways of hanging are good: nightdress by one side of lower hem, skirt by one side of lower hem, drawers by band, chemise by one side of hem, corset-cover by band, and combinations through center or by the band.

Starched garments should be taken from the line as soon as dry and dampened. They must be well moistened, but not wet. If too wet there may be difficulty on account of the iron sticking.

These general rules facilitate the ironing:

1. Iron laces and embroideries first, as they dry out more quickly because of their porous nature.

2. Iron next that part of the garment which will be least mussed by further handling or in which a slight wrinkle will not be a serious interference with good appearance.

3. Leave as much of the garment folded as is consistent with ease in ironing so as to retain as

much moisture as possible. It is sometimes wise to cover the unironed part with a cloth to prevent the evaporation of moisture.

To retain any article, large or small, in its original shape it must be ironed with the threads of the material. For instance, if a skirt is ironed diagonally across the threads or along the seams, instead of with the threads of the material, almost invariably the result is a sagging skirt. Also ironing with the threads ought to prevent wrinkling at the seams.

Under garments are ironed in the following order:

Nightdresses.—(1) Trimming, (2) sleeves, (3) yoke, (4) body. The body may be ironed double or it may be ironed single by placing over a board.

Drawers.—(1) Trimming, (2) tucks, (3) body, (4) band.

Skirt.—(1) Ruffle, (2) hem, (3) body.

Corset-covers.—(1) Trimming, (2) fronts, (3) back, (4) peplum.

Chemise.—(1) Trimming, (2) body. The body of the chemise may be ironed in either of the ways used for the nightdress.

Laces and embroideries should be ironed on a pad so as to bring out the pattern. Laces are often simply pulled into shape. All this is described in Chapter XXI. The garment itself, however, should be ironed on the right side so as to give better finish.

Crêpe and seersucker garments require no ironing. If lace-trimmed, the lace should be pulled into shape.

In laundering white materials the object should be to have snowy-white articles free from wrinkles. This result can be obtained only by thorough washing, careful rinsing, good drying, and careful ironing. If the time that can be given to laundry work is limited that should not affect the amount of clean clothing, but the housewife should then choose materials for clothing that do not require ironing. It is much better to have well ironed some of our clothes, and use some crêpy materials which do not require ironing for others, than to have all our clothes of fabric which requires ironing if there is not time enough—or strength enough—to iron all the clothes well.

XX

THE LAUNDRY: COLORED MATERIALS

THE art of dyeing has improved to so great an extent that many wash materials are now comparatively fast in color. However, this does not mean that they can stand the same treatment as white materials; it only means that with care the color may be retained. The cotton and linen fibers are so very tough and resistant that they do not take up dyes readily, and consequently they lose them easily. Dyes attach themselves to rather than unite with the cotton and linen fibers. Some colors are considered more stable than others. For instance, reds and pinks are generally considered stronger than blues and lavenders, but little can be told about the fastness of any color until it has been washed.

In dealing with colored materials it is always by far the safer way to try a sample first, whether it be washing, setting the color, or removing stains. This last is especially important. A reagent for removing a stain should always be

tried out first on a sample of a colored material; otherwise the result may be worse than the stain.

Dyers use chemical substances to cause a firmer union between the material and the dye. These substances are called mordants. The housekeeper also can use mordants, either for the purpose of strengthening a weak color or for making all colors fast. In general, it is better to set all colors. Even stockings retain a better color if the color is set in them.

The household mordants are salt, vinegar, sugar of lead, and alum. These are used in the proportion of one-half cup of vinegar or two cups of salt or one tablespoonful of alum or one tablespoonful of sugar of lead to each gallon of water. The material in which the color is to be set should be soaked in the solution overnight, if possible, and should be thoroughly dried before being submitted to washing. The effect of the salt and water is said not to be lasting. In using sugar of lead care must be taken, as it is a poison. The mordant property of vinegar is due to the acetic acid. Sugar of lead is lead acetate, a salt of acetic acid.

An interesting thing happened to a schoolgirl who was wearing a new dress in which the color was set by sugar of lead which had evidently not been washed out. She went into the chemistry laboratory, and the experiments happened to be with hydrogen sulphide. After working there about an hour one of her classmates turned to her

and exclaimed, "Why, Ada, I thought your dress was quite a bright blue!" Quick as a flash Ada answered, "It is," but, on looking down, she continued, "It was, but it isn't!" Naturally there was some excitement until finally the explanation was made that the lead acetate which was retained in the material had reacted with the hydrogen sulphide to form the black compound, lead sulphide, on the dress, causing a gray appearance. In general, lead acetate, because it is poisonous, is not recommended. In every household process it is better, when possible, to use a substance which is harmless.

In laundering colored materials it must always be remembered that the long-continued action of soap and water, the use of strong alkalies and acids, the use of hot water, and strong sunlight, all have a detrimental effect on the stability of the color. These facts complicate their laundering considerably.

If water is hard it must be softened with a mild alkali. The best for this purpose is borax. Colored clothes ought never to be soaked, and therefore they should never be badly soiled. This is a hard saying, especially for children's clothes, but the fact remains that it is far cheaper in the end to wash clothes often than to submit them to the wear and tear of removing a good deal of soil. For removing stains a weak organic acid, such as oxalic or tartaric acid, is the best to use. If the color is injured, even with this mild treatment, it

can often be brought back by the application of weak ammonia.

The best way to wash colored materials is to wet the articles in cold water and then wash as quickly as possible in warm, soapy water. Neutral soaps should be used, and soap must not be rubbed on the material. If badly soiled, soap solution may be rubbed on, but it is far better to avoid this. The dirt should be squeezed out rather than rubbed out.

Ordinary colored materials, if treated with care, can stand washing with soapy water, but sometimes, when the color is very delicate, either bran or starch water is used. The process is then the same as when soap is used. The material is washed in thin starch or in bran water, which is made as follows:

½ cup of wheat bran 1 pint of cold water

Mix the cold water and bran. Boil one-half hour, strain, and add another pint of warm water. Add to the wash water.

Bran water, as well as starch water, stiffens articles while it cleanses them. If the stiffness is undesirable the article may be rinsed in salt and water.

When thoroughly clean the article should be rinsed in two or three waters; care must be taken that all soap is removed. The last rinsing water may have vinegar or salt added to it. Many people believe that either brightens and also helps

retain the original color. To strengthen blues the rinsing water may be blue, and to strengthen tans and browns the rinsing water may be colored with a strong tea or coffee. Sometimes a small amount of dye of the same color as the material is added to the last rinsing water for the same purpose. This may give good results, but a small piece of the material should be tried in the colored water first, as sometimes unexpected hues are obtained from the combination of dyes.

The starching of colored materials is important. If the material is put into the starch right side out, the starch not rubbed in, and excess starch left on the material, we may expect to have a finished article the appearance of which is badly marred by starch scales. The best results are obtained by putting the material into the starch wrong side out, wringing well, and then rubbing between the hands to obtain a good blending of the starch with the material. The starch may also be colored according to the material, so that if it does scale it will be less noticeable. For dark materials gum arabic is often used in place of starch.

More ill effects are obtained from careless drying of colored materials than from careless washing. They should be hung wrong side out and in the shade. Quick drying is important, as the shorter the time the moisture is retained, the less danger there is of fading. As soon as dry they should be taken from the rope and damp-

ened. After dampening they should stand but a short time before ironing.

Colored materials ironed on the wrong side appear more like new material than when ironed on the right side. But the smoothness obtained by ironing on the right side makes the material keep clean longer, as the surface does not pick up dust so readily. For this reason ironing on the right side is the best for colored kitchen aprons and is sometimes used on children's clothes. The irons used on colored materials must be hot enough to give a good finish, but very hot irons should be avoided, as great heat may injure the color.

Stockings are treated like other colored materials. It is always advisable to wash the feet of new stockings before the first wearing, as the dressing added by the manufacturer frequently lessens the wearing quality. If the color is not considered fast it is a good plan to wash the feet of the stockings before putting the rest into the water. If necessary, soap may be rubbed directly on the feet of the stockings, but should not be elsewhere. They should be washed first on the right side and then on the wrong. They are rinsed like all colored materials and should be pulled into shape before hanging to dry. They are hung wrong side out by the top. Silk stockings are washed like any silk.

Stockings may be ironed or not, as desired. It they are ironed it should be on the wrong side

and with a warm, not a hot, iron. In ironing, the hand should be put way down inside, and as the hand is drawn out, the iron should follow. In ironing embroidered stockings care must be taken to have no crease on the embroidery. There is little reason for ironing stockings, and this is one of the places where work may be saved legitimately.

Until the art of dyeing is more nearly perfected we shall always have to deal with the question of fading. With care and thought almost all good colored linen and cotton materials can be made to retain their original colors as far as laundering is concerned. In the summer, of course, clothes are faded by being worn in the sun, but that problem is entirely outside the province of the laundry. Our aim should be to have colored materials leaving the laundry have the same shade as when they entered, and this can only be done by using the utmost care in washing, rinsing, drying, and ironing.

XXI

THE LAUNDRY: EMBROIDERIES AND LACES

IN laundering embroideries and laces one must not only have a care about the washing because of the fineness of the materials, but also one usually needs to exercise more care in the ironing or stretching, as the case may be. The finished article must not only show the design well, but also must retain its original outline. This is not always the easiest thing possible to accomplish, and it is especially difficult to bring about when there is a combination of linen and lace. The process is more complicated with a combination of materials, because there is an uneven shrinkage in the threads and very often also the stitches are pulled so tight that an ugly puckering results.

All real laces and fine imitation laces are better not washed, but rather dry-cleaned. The washing thickens them slightly, so that the lace loses its delicate and fine appearance. The dry-cleaning of laces is discussed in Chapter XXVI. It is usually impracticable to dry-clean lace on clothing

or household linens, even when it is real and fine, but in washing all lace needs exceptional care. The appearance of many laces is not seriously marred by washing, but they must be treated with the respect due to fine materials and delicate workmanship.

If lace is very fine it is better to sew it on a piece of thin cloth, such as muslin or fine cheesecloth. Each edge, and even the loops on the edge, should be caught down and the shape carefully kept by placing the lace in relation to the threads of the cloth. This preserves the shape and also prevents wear and tear on the lace.

Lace is treated like all fine materials—that is, the dirt is squeezed rather than rubbed out of it. Soap should never be rubbed directly on it, and only neutral soap should be used. It is often well to soak lace in soapy water to which either ammonia or borax has been added, in the proportion of one tablespoonful of either to one quart of water. This soaking loosens the dirt, so that less handling is required to make the lace clean, and of course the less handling, the less wear on the lace. Sometimes, in order to whiten lace, boiling is necessary.

Laces should always be placed in a bag for boiling, and fine laces should be kept on the cloth on which they have been sewed. Laces often need bleaching. One common way of bleaching lace is to wrap it around a bottle and place it in the sun, keeping it wet all the time. Javelle water is

also used, but it is better not to use it with fine laces, as there is danger of rotting the threads.

Like all materials, laces should be thoroughly rinsed. To give lace an écru color, whether it was white or écru originally, it may be dipped in a tea or coffee solution or an ochre-powder solution. In each case the strength of the solution depends on the color desired. This is practically the color in the solution itself when seen through glass against the light. Tea gives a yellow tone, coffee a warmer yellow, and ochre a tan tone.

For giving body to lace the following things may be used: two tablespoonfuls of borax or two tablespoonfuls of alcohol or one teaspoonful of sugar to one cup of water, or gum arabic as described on page 169. Sometimes a very thin starch is used, but this is apt to make the lace appear thick.

Black lace is best washed in black coffee containing ammonia in the proportion of one tablespoonful to one cup of coffee. It is washed in this in exactly the same way as white lace is washed in soapy water. For rinsing and for dissolving the stiffening agent coffee is also used.

Instead of ironing it is better to stretch lace while wet into its original shape on a well-padded board and pin out each point. Brass or black pins are safe to use, but steel pins may cause rust spots. If there is a raised pattern, such as roses in Irish crochet lace, for instance, these are picked up into shape. If allowed to dry this way

the lace appears like new when finished. If, however, lace is ironed it should be placed on a well-padded board and ironed on the wrong side. Care must be taken that each point is pulled out. Lace done in this way seldom, if ever, looks like new.

Lace curtains should be treated as much like other lace as practical. In every case they should be well brushed or shaken before putting into the water, as invariably they contain much loose dust. For stiffening, a very thin starch is used, but they must not be too stiff. Because of the variability of the thickness of the material, it is impossible to give the amount of starch to be used. Lace curtains should be put on curtain-stretchers, not ironed. Care must be taken that the curtains are pinned straight. Several curtains can be placed on top of one another on one stretcher. If a stretcher is not available, a sheet can be pinned out firmly on a carpet and the curtain pinned on that.

Just a word about curtain-stretchers. There are two types—those with stationary pins and those with movable pins. The former is the cheaper in the beginning, but the latter is the cheaper in the end. If the stationary pins break off there is no way of replacing them, but the movable pins can be replaced easily. The difference in the initial prices is very small. Prices for curtain-stretchers range from one dollar and fifty cents to four dollars.

When linen and lace are combined, as in the case of doilies, they are also pinned with right side up and allowed to dry. When dry it is well to place a piece of dampened muslin over the linen part and to go over it with a warm iron, then to remove the cloth and iron directly on the linen. This gives a gloss which always improves the appearance of linen. It is most unwise to try to save time by ironing the linen while the whole is wet, for just as surely as that is done the moisture from the lace will creep into the linen, dried by ironing, with the result that when the whole is dried there is an ugly ring where the lace joins the linen.

Embroideries are washed with all the care required by lace. Colored embroideries must be treated with the same precautions as other colored materials. Embroideries should be soaked and, if possible, washed in a suds made of neutral soap. If necessary, they may be boiled. They must invariably be thoroughly rinsed, and they may be blued. If the piece is small it should be ironed while wet, as this gives it good body and also a good finished appearance. If the piece is large, like a dress, the article of course must be dried, but it must then be most evenly and thoroughly sprinkled before ironing.

For ironing, the table must be well padded. If blankets or felt are not available for this extra padding a Turkish towel is an excellent substitute. In general, embroideries are ironed on the

wrong side. Great care has to be taken that they keep their original outline. It is a very simple matter to make a circular doily other than circular. To keep the outline there is just one unbreakable rule—to iron with the threads of the material at all times. Just as surely as the iron runs across the threads, there is a bulging of the edge. All doilies—circular, oval, square, rectangular, or any other form—must be stretched into shape and ironed with the threads of the goods. Doilies with much plain linen, such as simple scalloped doilies, are better ironed only lightly on the wrong side and then ironed on the right side, so that the plain linen may have a gloss.

Sometimes even with the greatest care embroideries have a tendency to pucker; they may hump up in the center or they may pull around the embroidery itself. The best way to overcome this difficulty is to pull gently and stretch into shape as much as possible. If it still persists in puckering, sometimes a dampened cloth placed over the puckered part and pressed will shrink out the extra fullness. There are cases where the embroidery is too tight, when the only resort is to pin it out as one would lace.

Drawn-work is perhaps the most difficult needlework with which we have to deal. The reason for this is that in drawn-work the threads of the material are pulled very tight, and the thread often shrinks more than the linen itself. There is only one thing to do with drawn-work, that is

before ironing to pull straight those threads of the material that are the basis of the drawn-work, and then to stretch the drawn-work in every direction without pulling these basic threads out of line. This must be done with care or the threads snap. If stretching is not done here, the outside of the piece forms a little ruffle. The mistake many people make is to iron along the hem first. This, of course, is wrong, since it stretches just exactly the part that should not be stretched. Sometimes with badly puckered pieces the only thing to do is to pin them out. This is done especially with small articles. The requisites for ironing drawn-work are, first and foremost, infinite patience, and then pulling and stretching.

On all linen, whether pillow-case or napkin, the monogram should be ironed first on a pad, like any other embroidery.

Before cleaning, every piece of lace and embroidery should be looked over for any necessary repairs. If a stitch in time saves nine on ordinary materials, here it saves at least nineteen, and perhaps the whole piece. After cleaning, the piece should be examined again and any necessary repairs made. This is part of the cost of such luxuries.

It may not be amiss also here to remind the housewife that when she buys or makes a beautiful piece of embroidery, lace, or drawn-work, she should count not only the original cost, but the cost in time and money of the many cleanings

that must follow use. And here again, as with fine underwear, the real cost can be calculated only by computing the number of times the article will stand cleaning, adding the cost of cleaning to the original price, and dividing this cost by the number of cleanings or the weeks or times of wear. The habit of such computations would result in greater simplicity in most households, and generally such simplicity would be an esthetic as well as an economic gain. Lace curtains, for example, of the type once so common in "well-furnished" houses, are not as beautiful as the other materials now commonly used for curtains, and their total cost, where they are kept properly clean, is very heavy. The complications of embroidery and lace, plush and silk, many draperies of many kinds, often detract from the beauty of the house, while they add heavily to the cost of its maintenance. Simplicity here, as elsewhere, makes for cleanliness and may and should make for beauty.

XXII

THE LAUNDRY: SHIRTS, SHIRT-WAISTS, COLLARS, AND CUFFS

"TO think that I have always grudged paying twenty-five cents for the laundering of a shirt-waist!" was the remark which a student made most feelingly as she held up the first waist she had ever ironed. It was quite evident from the expression on her face and the tone of her voice that her respect for any one who could launder a tailored waist had increased greatly. The laundering of shirts, shirt-waists, collars, and cuffs not only requires time, but experience is also necessary for good results. With patience and care most articles can be well laundered, but for heavily starched articles experience also is a necessity.

In washing shirts and shirt-waists the neck-band and cuffs must have special attention. Before soaking they should be well soaped, and if a washing-machine is used they should also be soaped well, as suction alone may not take the

dirt from these parts. Collars and cuffs must have special attention on the turns. Colored garments must be treated with the care required by all colored materials and white ones washed like all white clothes. The garment is starched all over in starch made in the proportion of one and a half tablespoonfuls of starch to one quart of water, and then it is hung to dry.

When the garment is sprinkled, the cuffs, front pleat, and the collar-band are cold-starched. The cold starch is made as described on page 165, and the part of the article to be starched is dipped into it and then squeezed and rubbed between the hands so as to blend the starch with the material. The cold-starched portions are placed in a damp cloth and the whole garment rolled up and allowed to stand an hour if possible.

Thus far our problem is comparatively simple, for with care we can all wash a garment clean, starch it in either cooked or cold starch, and dampen it evenly. The ironing, however, presents difficulties which can be overcome only by experience.

Before beginning to iron, the cuffs should be pulled into shape. The cuff is covered with a piece of muslin or fine cheese-cloth and then ironed partly dry on both sides. This takes off the superfluous starch so that there ought not to be any scaling. The ugly yellow spots so often seen on cold-starched articles are the result of the scorching of the starch specks by the heat of

the iron. The cheese-cloth is now removed and the cuff ironed first on the wrong side and then on the right side, so that the right side will have a good finish. All cold-starched parts of the waist should be ironed in the same way before the rest of the waist.

The sleeves are next ironed. A sleeve-board is of use here, although many laundresses can obtain splendid results without one. More than one amateur has trouble in ironing sleeves because she uses the sleeve-board wrongly. Of course the sleeve-board is then blamed and is often discarded as being much more trouble than it is worth. In using a sleeve-board the sleeve should be pulled over the free end so that the cuff is at the small end of the board. It is also well to have the seam on the edge of the board. The bottom of the sleeve is then ironed, and as it is ironed it is dropped from the board, the next portion ironed, and so on until the whole sleeve is finished. By using a sleeve-board the sleeve can easily be kept uncreased.

If, however, one has no sleeve-board the sleeve can be creased along the seam, one side ironed flat, then turned, and the other side ironed. The crease can then be opened out, dampened slightly, and removed by pressing.

In ironing the fronts it is better to iron from the neck-band to the bottom of the waist. In this way extra fullness is pushed to the bottom instead of the top, where it is so noticeable. Most

of us perhaps have had difficulties with an ugly bunching just below the collar, not only with tailored waists, but with lingerie waists. A great deal of that can be rightly attributed to ironing from the bottom up to the top. In ironing tailored waists, then, the order is (1) the heavily starched parts—cuffs, front pleat, and collar-band, (2) sleeves, (3) both fronts, (4) back. The folding is done according to the diagram.

In ironing shirts the order is the same. The front of the shirt is more easily ironed over a bosom-board. This is a small board about the size of the shirt-bosom. By putting this board into the shirt there is no interference between the back and the front. Sometimes the end of the ironing-board can be used for this purpose.

A polishing-iron can be used for giving finish to the heavily starched parts. This is used after the cuffs and bosom are ironed as usual. The surface is dampened slightly by going over it with a damp cloth. The polishing-iron is then pushed over the surface quickly and with pressure. If more polish still is desired, the surface can again be dampened and ironed.

For a dull finish, often called the domestic finish, the polished surface is carefully rubbed with a slightly moistened cloth. This takes off the gloss, but the material still retains a good finish.

Collars and cuffs, whether attached or detached, are ironed in the same way as the heavily starched

parts of the waist. Turned-down collars and turned-back cuffs are ironed flat, and then they should be rubbed on the folding-line with a slightly moistened cloth. This softens the fold so that the turning is accomplished without blistering.

In the last stage of ironing, collars and cuffs are rolled. This is brought about by passing the iron over the wrong side, at the same time curving the cuff or collar after the iron. This should be done two or three times from either end.

A more approved way of obtaining great stiffness is by the use of starch jelly, the making of which is described on page 166. Thick starching is done while the material is damp. The portion to be starched is placed out flat, wrong side up, on a table covered with a damp cloth. The jelly is then rubbed into the material with the hands until the material feels full of starch and the thickness of the material feels as one. The superfluous starch is wiped off with a damp cloth. Before hanging to dry the starched parts must be stretched smooth and true as they are to be when ironed.

Materials starched with starch jelly are never dampened by sprinkling, as drops of water cause blistering. Instead they are dampened by covering with a damp cloth and placing under pressure. It is better not to roll them; they should be kept flat if possible.

Articles starched with jelly are ironed like cold-

starched materials, except that it is not necessary to cover them with a cloth first. This starch ought not to stick, since it has been cooked thoroughly. Excellent results can be obtained by this method of starching, both in applying and in the ironing, but practice is necessary. In fact, for ironing heavily starched articles experience is absolutely essential for a good finish, as a certain speed is necessary to keep the material from drying out.

All blouses are ironed like the tailored waists, but none require the experience that they do. If a soft or thin blouse does dry out it can be easily dampened again, but the heavily starched parts of garments are not improved by extra dampening.

Silk and flannel waists are treated with the same precaution as all silks and wools.

The laundering of a tailored waist is a difficult task for the novice, but it is a feat which every one can accomplish, provided she practises. This is one of the cases where only practice alone makes perfect.

XXIII

THE LAUNDRY: SILK AND WOOL

THE silk and wool fibers are very different from cotton and linen fibers. Cotton and linen fibers are of vegetable origin; silk and wool fibers are of animal origin. The wool fiber has a characteristic appearance which easily distinguishes it under the microscope from any other fiber. Its rounded surface is covered with little horny scales, which all lie in the same direction. According to the source from which the wool is obtained, the surface of the fiber is comparatively smooth or is serrated. The wool fiber is composed of numerous small segments or cells, the overlapping edges of which give the fiber its characteristic horny surface.

When woolen cloth is wet its fibers swell and its projecting edges loosen. As the material dries, the scales of adjacent fibers interlock, drawing the fibers of the fabric closer together. When this interlocking goes too far the result is the board-like appearance that characterizes poorly washed

wools. This interlocking is increased by rubbing briskly while wet, by using a hot iron, by change of temperature while wet, by the use of strong soaps, and by rubbing soap directly on the material. Therefore all these should be carefully avoided. The shrinkage brought about by the use of strong soaps is the result of chemical action. The alkali of the soap acts chemically on the fiber, softens it, and causes the projections to become more prominent. This increases the interlocking of the fibers and so the shrinkage.

Strong solutions of alkali, such as washing-soda, must be avoided, as they have a softening effect on wools and will reduce the wool in time to a soap-like consistency. Mild solutions of weak alkalies, like borax and ammonia, may be used, and are only slightly injurious. Their use is often resorted to in washing badly soiled wools.

Weak acid solutions do not affect woolen fabrics. They can be allowed to dry on without resulting in any evidence of a weakening of the material. Thus they can be used when necessary for removing stains. Strong acids, however, decompose wools.

The laundering of wools requires more care than the laundering of any other material. There are many pitfalls for the novice in both the washing and drying of woolens, so that the best thing to do is to find out what to avoid. For good results the laundress must never use water hotter than lukewarm, must avoid changes in tempera-

ture in the wash and rinse water, must refuse to use strong soaps and alkalies, must never rub soap on the material or rub the material itself, must not wring by hand, must take care as to position in drying, and beware of too quick drying. She must also carefully measure, before washing, knitted or crocheted articles, so that they can be stretched to their original shape.

The best way of cleansing wools is first to brush the material to take off as much dust as possible. The surface of woolens is so rough that it can hold a great amount of dust, and matters are greatly facilitated by getting rid of as much loose dirt as possible before putting the garment into water. If the dust is left on it forms a muddy mixture with water and discolors the fabric.

The water must be soft. If necessary to soften hard water for the purpose, borax or ammonia should be used. The water should be lukewarm and the suds should be of a neutral soap. Soap solution should be used for the purpose.

The garment made ready for washing is placed in the tub of water thus prepared, kneaded rather than rubbed, and kept under water. As the suds fall, more soap solution must be added. When necessary to lift the article out of the water to see whether it is clean, one hand should be placed under it so that it may not be stretched by the weight of the water in it. For almost all woolen garments at least two wash-waters are necessary, and for some garments, such as sweaters, three

and four wash-waters are necessary. The last suds ought to be practically clean after using.

The water for rinsing must be the same temperature as the wash-water, and two or more rinse-waters should be used. For white wools the last rinsing water may be slightly blue. To the last rinsing water glycerine may be added in the proportion of one tablespoonful to two gallons of water. This gives the wool some oil to take the place of that which was taken out in washing. The oil makes the wool softer.

If a wringer is not available, the water should be squeezed from the fabric, not removed by twisting the material. The twisting increases the interlocking of the scales and thus increases the shrinkage. As much water as possible should be removed from the material.

Crocheted and knitted articles, such as shawls and sweaters, should be placed on a flat surface, covered with a cloth, patted and pulled into shape. Oftentimes the garments shorten in length and stretch in breadth, and *vice versa*. Either condition can be overcome by pulling to stretch it and then patting it to take in the extra fullness. Any garment must be left in the shape in which it is desired to have it when dry.

The drying-room should not be too hot nor too cold; ordinary room temperature (65° to 70°) is the best. Placing near the fire to dry quickly increases the shrinkage. Drying in the sun increases shrinkage and also yellows the material,

if white. Drying by pulling into shape is far preferable to other methods. One common way of drying a sweater, for instance, is to place it in a bag or pillow-case and hang it up until dry. The result is that the garment usually dries quite shapeless. Oftentimes baby's stockings and shirts are dried by placing on forms. This does away with the necessity of patting and pulling, and is most satisfactory where garments need frequent washings, as do baby's things. The only way to make shawl fringes soft is to pull the threads apart. This is a bit tedious, but when finished the fringe is as soft and fluffy as when new.

Flannels need the same care in washing as other wools. If they can be dried flat and stretched into shape they require no ironing. If, however, that is not possible they are hung up to dry, the same precautions being used about temperature as when dried flat. When absolutely dry they can be ironed by placing a dampened cheese-cloth over the material and pressing with a warm iron. Here again the laundress must remember that extreme heat means shrinkage. When the cloth is taken up the nap of the wool should be drawn up so that the material is soft and fuzzy like new material.

Blankets are washed like other flannels. Very often two tablespoonfuls of borax or one-half cup of alcohol, or both, are added to the soap solution recipe on page 159 in using it for making suds for

blankets. A washing-machine is a very great aid in cleaning blankets, as it eliminates so much otherwise necessary handling. Blankets are very heavy indeed when full of water. Perhaps the best way of drying blankets is to place them on curtain-stretchers. In pinning them care must be taken that the threads and stripes are straight and true. If the blanket is brushed with a whisk broom when almost dry, the nap is brought up and the whole made soft and fluffy. If a curtain-stretcher is not available, the blanket may be placed over a line lengthwise. In this way, if the color in the stripes does run, it will run into the stripe. Blankets, if placed on the line, should have at least six inches put over the line and they must be pinned at frequent intervals. In this way there is not a great deal of stretching.

Down quilts.—The color should be set if there is any danger of its fading. As many suds should be used as necessary, and two or three rinsing waters. A washing-machine is good for this purpose. They should be wrung through the wringer and hung straight on the line. If it is a windy day, so that quick drying is possible, so much the better. In fact, it would be better not to wash quilts except on a clear windy day.

When dry they should be placed on a large table and the filling distributed evenly by shaking, pulling, and patting. They may then be pressed with a cool iron.

For dark woolens, and especially black goods,

soap-bark solution may be used exactly in the same way as soap solution. Many people judge from experience that there is in this way less danger of dark materials becoming shiny. Soap-bark solution is made by boiling one ounce of soap-bark and one cup of water together for five minutes. It is then strained. Soap-bark may be purchased at drug-stores.

Occasionally wool shrinks, even though washed properly. For instance, a student who had been trained in laundering washed a Shetland-wool sweater and gave it all the care that the finest wool or silk could possibly have. When she came to stretch it out into shape she found, to her surprise, that it had shrunk beyond recognition. On looking for the reason she found that the sweater had been worn under a rain-coat and had been wet with perspiration. Apparently the fibers were injured by the heat and moisture from the body. In such a case there is no remedy except a new sweater.

Silk.—The silk fiber resembles the wool fiber quite closely in many of its reactions, but it is far different in form. It is a very long, smooth fiber, so that when silk is rubbed the fibers slide over one another and there is very little, if any, shrinkage.

Even weak acids weaken silks, but not to the extent that they do cotton and linen fibers. Strong acids attack and disintegrate silks. Alkaline solutions weaken silks and ruin their luster.

The same precautions are necessary for washing silks as for wools, as both are animal fibers. The silk fiber, however, is not quite so sensitive to changes in temperature as the wool fiber. In laundering colored silks a sample should be tried first, and if the color is not stable it should be set with vinegar like cotton material.

Silks should not be wrung by hand, but the reason for not doing so is different from that of wools. When silks are wrung by hand the threads slip over one another, the result being a wavy appearance in the threads, and there is no way of overcoming this appearance. The water must be squeezed out either by hand or by the wringer. It is well to place the silk between cloths while wringing.

Pure white (not cream) silk may be slightly blued. The last rinsing water may also contain gum arabic solution as described on page 170. Heavy silks have body enough without the gum arabic, but the appearance of thin silks and old silks is improved by its use. Sometimes very large pieces of thin silk are put into very thin starch so as to make them firmer. Starch is used because it is cheaper than gum arabic.

After wringing, the silk is placed in a cloth (a Turkish towel is excellent) and rolled up. Then it is a good plan to clap it between the hands to help get out the excess moisture. It is allowed to stay in the towel until ready to iron. Silk should be ironed while damp. It must never be sprinkled.

Just as sure as silk is sprinkled there is a spotted appearance.

Silk may be ironed directly on the wrong side with a not too hot iron, or sometimes better results are obtained by placing a thin cloth over the right side of the silk and ironing. This latter method is often better for very thin silks, as they are not made so stiff. Too hot an iron makes silk stiff and it is also apt to yellow silk. Ironing while wet makes silks very stiff and papery.

Pongee silk may be successfully laundered by drying absolutely and then ironing with a warm iron on the wrong side. It may also be treated like other silks.

Silk crêpe may be taken from the last rinsing water without wringing, spread evenly upon a clean table, and allowed to dry. Sometimes, however, when the silk crêpe is in the form of a garment, such as a waist, it is better to iron it the same way as silk. If the crêpe cannot be stretched, it has a tendency to draw up too much, so that the garment becomes too small. Silk woven underwear is treated like any silk and should be stretched into shape, not ironed.

The cleaning of ribbons is not always as successful as it might be. The best way to wash ribbon is to wet it and lay it out perfectly flat on a clean table, or, better still, on a marble, porcelain, or glass surface. If not badly soiled it can be washed with a soft cloth and soap solution, but if that is not sufficient for good results it can

be scrubbed with a brush and soap solution. It should be washed on the wrong side and then the right side. When clean it must be thoroughly rinsed in clear water and as much water as possible removed by pressing the ribbon with a cloth, at the same time keeping it smooth. It should be left stretched on the table perfectly flat, with no air-bubbles under it. If it is not placed smoothly on the table it will have just as many rough places in it when dry as there are air-bubbles under it when placed on the table. Wash ribbons, when almost dry, may be ironed with a cool iron. Ribbons are often dried by wrapping around a bottle. The principle is the same, only there is more danger of rough places in the ribbon dried on the bottle, as it is impossible to see the whole ribbon at once, as when placed on the table.

Silks and wools, because they are animal fibers and are composed mainly of nitrogenous material, do require different treatment from cotton and linen, which are vegetable fibers and are made up mainly of cellulose. We all know that animal and vegetable foods require different treatments. For instance, in making a jelly from apples, boiling is a necessity, and in making jelly from gelatine (an animal substance) we get no jelly if we boil it. Just as vegetable and animal foods have to be treated differently in many respects, so the textiles made of animal and vegetable fibers must have different treatment in laundering if results are to be satisfactory.

XXIV

DRY-CLEANING

DRY-CLEANING is rather curiously named, for it does not mean cleaning without the use of liquid, but only cleaning without the use of water. Liquids are used, but they are those that absorb or dissolve grease. The process is used when the article to be cleaned would be injured by the use of water and soap. This is the case with dresses and other garments made of silk and wool, especially where they are lined or have garnitures or trimmings. It is often advisable for fine cotton or linen dresses because of trimmings and of difficulties in ironing.

The most common liquid substances used for dry-cleaning are ether, benzine, naphtha, chloroform, and gasoline. Of these, gasoline is perhaps the most used, because it is inexpensive, it acts quickly, it evaporates readily, and its odor is not much more lasting than that of other cleansers. All of these are best used out of doors or in a good draught, and none of them can ever be used with

any degree of safety where fire in any form has a chance to come in contact with either the liquid or the vapor it sends all about. Their use is perfectly safe if this precaution is observed.

Flour, corn meal, magnesia, French chalk, and Fullers' earth are the dry materials used for cleaning.

In general, if a garment has several spots it is better to clean the whole garment rather than the individual spots. There is always danger of leaving marks of a spot. If, however, a spot alone is to be cleaned, the cleaning agents should be rubbed toward the center to prevent spreading as much as possible, and it is also well to surround the spot with magnesia or some other powder to absorb as much of the cleaner as possible. Putting a piece of blotting-paper under also helps.

In removing a single spot chloroform or ether does the work without any injury to fabric or to color, and the odor evaporates almost instantaneously. Either must be used with great care, not only for fear of explosion, but because their vapors quickly produce unconsciousness. They should never be poured from the bottle into an open dish, but applied by a clean cloth wet at the mouth of the bottle, which must be recorked *at once*. Because of quick evaporation one must work quickly, but it is easy to remove any spot caused by grease (and that means most spots) in this way.

The commercial cleaning fluids are more expen-

sive than the liquids named here, and most of them have some ingredient that slightly changes the color in many fabrics. It is never safe to use one without trying it first on some unexposed part of the material.

A good cleansing agent that can be made up, tightly corked, and kept on hand, is made by mixing equal quantities of ether, alcohol, and ammonia. This is simply used for sponging off spots. Like the commercial cleaning agents, it should be tried on a small piece of the goods before using on the material itself, so that there will be no danger of injuring the color.

A perfectly clean piece of old black cotton stocking is excellent for applying a cleaning fluid to dark material. The top of a discarded stocking, cut into pieces about four inches by three inches, will last for some time, and a box of these will provide a fresh piece for each spot. For light materials a bit of soft old white linen is good, but not table-linen, as the nap is likely to come off.

In cleaning a whole garment it is a good plan first to brush well and second to mark each spot with white thread before putting into the gasoline bath. Then the spots can be found and given special attention without much searching. A vacuum washing-machine is excellent for the dry-cleaning of large articles.

A second receptacle should be ready for a second gasoline bath, as, unless a garment is rinsed in clean gasoline, it will have a clouded, streaked ap-

pearance. If the dirt is removed from gasoline that has been used for cleaning the gasoline can be used again. Gasoline should be kept tightly corked in stone jugs (preferably out of the house), and the best way of removing the dirt after using is to pour the gasoline back into the jug through a piece of filter-paper (obtainable at any drug-store). Jugs should be plainly marked *Gasoline*, and those containing liquid used once and filtered should be designated in some way (such as tying a strip of red cotton about the neck), as this liquid should be used only for the first bath, the second always being of unused liquid.

Any garment which has been cleaned in gasoline or benzine should be allowed to stay in the fresh air until the odor has disappeared entirely. If badly wrinkled the garment may be pressed on the wrong side.

For cleaning with the powders the material is covered with the powder, rolled up, and allowed to stand for at least twenty-four hours. It is then unrolled and the powder brushed or shaken from the material. Fine materials, such as laces, are spread out on a paper and the whole covered with the powder, so that there is no danger of any part being left untouched. Fine laces are usually cleaned with French chalk or magnesia.

Flour and meal are not as good to use as the other powders, because if they are not entirely removed from the material there is danger of insects. Magnesia and French chalk are most

used for light-colored and delicate fabrics, and Fullers' earth for heavy materials such as carpets.

Sometimes when there is no danger of water affecting the color, Fullers' earth is applied moist. It is also sometimes moistened with gasoline or benzine.

Gloves.—Gloves are cleaned with gasoline the same as other materials. A small brush is a great help for this purpose. A very good way to clean gloves is to place them in a jar of gasoline and allow them to soak, shaking the jar occasionally. When they appear clean they should be rinsed in a jar of clean gasoline. The advantages of this method are that it enables the worker to keep her hands out of the gasoline entirely, and that there is little of the odor escaping during the process.

Feathers.—It is difficult for the amateur to clean feathers well, and usually advisable to give them to a professional cleaner. Feathers, however, can be cleaned with flour, corn meal, French chalk, or Fullers' earth. The feather is thoroughly shaken up with any one of these and allowed to stay in the powder for about twelve hours. It is then taken out of the box or bag and thoroughly shaken. If still soiled, the process can be repeated. Any of these reagents acts more quickly and better if slightly heated. In general, gasoline should be avoided in cleaning white feathers, as it makes them gray, but it is sometimes used for colored feathers. Professional cleaners clean

feathers with a suds of neutral soap, but this is a method best avoided by the amateur.

Velvets.—Velvets may be freshened by cleaning in gasoline if soiled and then hanging in the open air until the gasoline has evaporated entirely. To raise the nap and take out creases a heavy wet cloth is placed over a hot iron and the velvet placed on this with the nap out. The velvet and cloth are pulled slowly over the iron and the steam raises the nap. There is a clever little device on the market which can be placed on the spout of a teakettle and the velvet drawn over this. It is much easier to manipulate than the iron, as it does away with the bother of dampening the cloth all the time.

Down quilts can be cleaned with gasoline the same as any other article, but they may also be washed as described on page 224.

As has already been said several times, dry-cleaning with petroleum products must be conducted with care because the vapors from all are inflammable. The statement is often made that cleaning with gasoline is more easily accomplished if the gasoline is heated. This statement is true, but it is rather dangerous for an inexperienced person to warm gasoline, even if a water bath is used.

Only a small proportion of housewives do dry-cleaning at home, preferring to send to a commercial cleaner. There are, however, few greater economies in clothing for those who wish to be

well dressed than doing dry-cleaning at home. Many a garment is made as "good as new" that otherwise is practically useless. Any intelligent woman can avoid the possible danger. The only other difficulty is the disagreeable feeling produced in the hands by contact with gasoline. This can easily be avoided by the use of rubber gloves, but even when these are not used, washing the hands in hot soapy water and rubbing with cold cream will soon do away with the difficulty.

XXV

THE GENERAL CARE OF CLOTHING

THE care of clothes entails much more than their laundering or dry-cleaning. If laundering clothes would but take care of them, how much more time would be left for other things! Frequent washing of clothes washable with water has been urged elsewhere, but this frequency should apply to all washable garments, including silks and wools. Silks and wools will keep in good condition much longer if they are washed before becoming badly soiled.

Other than the laundering there is the care which clothes must receive all the time. Mending is one of the most important factors in keeping clothes looking well. If clothes are examined for imperfections when taken off, and mended just as soon as possible, they not only wear longer, but they also look better. This mending should include tightening buttons and hooks and eyes, as well as re-enforcing weak places, darning, and patching. A loose button can be nothing else but

slovenly. Washable collars, yokes, or guimpes need constant attention. They should always be easily removable, so as to encourage frequent washings. They should also be taken off the dress at once when soil is noticed. If they are left on, there is too great danger that the owner of the dress will put it on "just once more."

Brushing is also important. Clothes brushed whenever taken off retain a freshness that can never be regained if once lost through carelessness in this detail. Not allowing dirt to become really entangled in the fibers keeps material new-looking.

Airing clothes is also necessary. Airing clothes-closets helps in this, but clothes should be taken outdoors and given a complete air bath once in a while. Protecting dresses as they hang in closets by light washable covers means a great saving. When the housewife sees how much dirt a dress-cover holds she realizes what her dress has escaped.

Shoes take time to keep in good condition. After each wearing they should be well aired, and brushed with a soft brush or a piece of lamb's wool. If they are put on forms the forms should be perforated so that air can get inside. The stretchers that have toe-piece and heel-ball of wood and a strip of pliable steel between are both excellent and cheap. Anybody should be able to afford these for every pair of shoes. Care of shoes includes cleaning and

polishing. Nothing can mar one's entire appearance quite as completely as careless-looking shoes. Untidy gloves, however, are a very close second.

Every household should have a good shoe-cleaning outfit, and the children should be taught its use as soon as they are old enough. The equipment should include a good oil for rubbing on wet shoes.

Too many Americans fail to have shoes mended by a cobbler—reheeled or resoled or sewn or patched—in time to lengthen their life by weeks. Every neighborhood has its little shoemaker's shop where this can be done.

Hats should always be brushed after wearing. A soft hat-brush is best for most hats, but if for any reason dirt has become embedded in the hat a whisk broom may be used. For general use the whisk broom is perhaps too stiff, but its use is sometimes legitimate. Trimmed hats may be freshened at home by new ribbons or recurling feathers, and their service much lengthened. Straw hats may be bleached at home also.

Clothes should be marked. Name-tapes and writing in indelible ink are both good. The name, however, should be placed with care. Some special point on a hem is a good place. The thickness of the hem prevents the name from showing through. Stockings not only should be marked with the name, but they should also have distinguishing marks so that they can be paired without difficulty. This can be done by having

letters or numbers following the name. Then the pairs of numbers can be matched. This is much more satisfactory than trying to pair them by matching the condition of the stockings.

Proper care of clothes does take time, but it is most assuredly a case where a small amount of time spent daily means a great saving of time in the end and a lengthening of the life of the clothes. It also frequently means the difference between being passably dressed and well dressed.

XXVI

CLEANING-CLOSETS

CLEANING-IMPLEMENTS in general should be hung up whenever possible. A way to hang can always be provided by inserting a screw-eye, of a size to correspond with the size of the implement, in the end of the handle. Another method is to catch the bottom of the handles of implements, as just above the bristles of the broom, into hooks (as in illustration).

Everything used in any cleaning process should be thoroughly cleaned before putting away.

Cleaning-closet.

A. Implements:

1. Broom.—A good corn broom should be in every cleaning-closet. In many cases it is wise to have two, one of which should be stiff and coarse for outside use. Cost, $.35 to $.75.
2. Long-handled hair brush for uncovered floors. Cost, $.75 to $1.50.
3. Carpet-sweeper for taking up surface dirt. Cost, $2.50 up.

4. Mops:
   (*a*) Dry mop.—This may be just a string mop or it may be an oiled string mop. In either case it should be freed from dust after using, and occasionally it should be washed in warm soda or soapy water, rinsed and dried. Cost, $.75 up.
   (*b*) Wet mop.—A good mop-handle to which a soft cleaning-cloth can be attached is the most satisfactory. Pieces of discarded woven underclothes make excellent mop-cloths, as they are soft and absorbent. Loosely woven cloths can be purchased for this purpose also. Mop-handles cost $.10 up.
   (*c*) Mop-wringers are a great help. They save not only the hands, but also the back, as one does not have to bend over so much. They are fastened to the side of the pail. Cost, $.50 up.
5. Dust-pan.—This should have a firm steel edge so that it can lie flat on the floor. Long-handled dust-pans

save the back, but they are awkward to empty. The use of a short-handled dust-pan need not be tiring if the cleaner will but learn to drop on one knee in using it rather than to make a bow of her back. Cost, short handled, $.20 up; long-handled, $.50.

6. Short-handled hair brush. Cost, $.35 up.
7. Whisk broom. Cost, $.15 up.
8. Brushes for furniture.—An assortment of paint-brushes is excellent. Special upholstery and button brushes are also good.
9. Radiator-brush.—This is a slender brush with a long handle so that one can get in between the coils of the radiator and the wall. Cost, $.45 up.
10. Scrub-brush.—This should be fairly stiff and is needed for scrubbing unfinished wood. Cost, $.25 up.
11. Dusters.—The edges of all dusters are better finished. This precaution is especially necessary with cheese-cloth dusters, as they ravel so easily.
    (*a*) Cheese-cloth or old soft cloths are good for ordinary use. No cloth that sheds lint should be used. In general,

dusters should be used slightly dampened or oiled. Enough moisture can be obtained by holding over the steam of a kettle or by placing a few drops of water in one corner, wrapping up tightly, and allowing the duster to stand a short time. Oil may be applied in the same way. Care must be taken that dusters are not so moist that they streak. There should be just enough dampness to hold the dust.

(*b*) Silk.—These dusters are excellent for fine furniture, as there is no possibility of lint.

(*c*) Chamois.—Moistened chamois is sometimes used for dusting, and soft dry chamois is excellent for polishing glass, metals, and furniture.

(*d*) Dustless dusters are those that have been chemically treated with oil, often crude-oil, so that they hold dust. The material is either cheese-cloth or flannelette. Dustless dusters should be washed frequently. Cost, $.15 up.

12. Carpet-beater. Cost, $.10 up.
13. Pails of fiber or galvanized iron are necessary for holding water. Cost, $1.00 up and $.25 up.
14. A basket or pail for carrying small cleaning-utensils and reagents from one place to another has its place in a cleaning-closet. There are special enameled tin baskets on the market for this purpose. Cost, $2.00.
15. Refrigerator-brush.—A brush with a long flexible wire handle for cleaning the pipe of the refrigerator. Cost, $.20 up.
16. Small step-ladder.—This should be firm and so made that there is no danger of its collapsing unexpectedly. Cost, $1.75.
17. Rubber gloves. Cost, $.40.
18. Rubber window-brush. Cost, $.35 up.
19. Lamb's-wool brush for ceilings and walls. Cost, $.75 up.

B. *Necessary cleaning reagents:*

1. Mild, medium, and strong soaps.
2. Scouring soaps or powders.
3. A good silver polish or a silver cleaning pan.
4. A good brass polish.
5. A good furniture polish.
6. Floor wax.
7. Washing-soda or washing-powder.

8. Bath brick.
9. Kerosene.

C. *Desirable additions to the cleaning-closet and suitable amounts for the ordinary household:*

1. One pint concentrated ammonia, to be diluted as needed. $.25.
2. Two ounces oxalic acid. To be labeled "Poison." $.02 oz.
3. Two ounces French chalk, $.02 oz.; or four ounces Fullers' earth, $.02 oz.
4. One pound borax. $.10.
5. One pint denatured alcohol. To be labeled "Poison." $.35 qt.
6. One-half pound whiting. $.01.
7. Four ounces fine powdered pumice. $.05 lb.

Laundry closet:

1. Mild, medium, and strong soaps.
2. Starch—lump and pulverized.
3. Bluing.
4. Wax.
5. Salt.
6. One quart Javelle water.
7. One pint hydrogen peroxide. $.25.
8. Two ounces oxalic acid. $.02 oz.
9. Eight ounces hydrochloric acid. $.01–$.02 oz.
10. One pint concentrated ammonia. $.25.
11. Washing-powder or washing-soda. $.02 lb.
12. Four ounces gum arabic. $.05 oz.

13. Four ounces alum. $.01 oz.
14. One pound borax. $.10.
15. Two ounces French chalk. $.02 oz.
16. White blotting-paper.

APPENDIX

SOME HELPFUL PUBLICATIONS

United States Department of Agriculture, Washington, D. C. (Free or at a nominal cost.)

Bureau of Entomology circulars:

No. 5. *The Carpet-beetle or Buffalo-moth.*
No. 34. *House Ants.*
No. 46. *Hydrocyanic-acid Gas against Household Insects.*
No. 47. *The Bedbug.*
No. 48. *The House Centipede.*
No. 49. *The Silver-fish.*
No. 50. *The White Ant.*
No. 51. *Cockroaches.*
No. 71. *House Flies.*
No. 108. *House Fleas.*

Farmers' Bulletins:

No. 345. *Some Common Disinfectants.*
No. 369. *How to Destroy Rats.*
No. 459. *House Flies.*

The Cornell Reading Course. New York

State College of Agriculture, Cornell University, Ithaca, New York. (Free on application.)

No. 4. *Household Bacteriology.* By Martha Van Rensselaer.

No. 11. *The Laundry.* By Flora Rose.

No. 23. *Rules for Cleaning.* By Mary W. Watson.

No. 25. *Saving Strength.* By Emily M. Bishop and Martha Van Rensselaer.

No. 27. *Choice and Care of Utensils.* By Ida S. Harrington.

No. 41. *Household Insects and Methods of Control.* By Glenn W. Herrick.

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